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RAILWAY AGE

Smart Politicians With Their Heads in the Sand

The question of the division of railway revenues between railway owners and railway labor is primarily one of economics. That is to say, it does not hinge mainly upon how much railway investors *ought* to get or how much employees *ought*, in justice, to receive. Rather, the question first to be answered is: How much *must* be paid to capital and how much *must* be paid to labor in order to get both capital and labor to work for the railroads. Because unless *both* capital and labor continue to work for the railroads, there cannot be any railroads. Only after the minimum requirements necessary to attract needed capital and labor have been met, can any moral question arise as to how the remainder ought to be divided. There is no basis for an argument between "capital" and "labor" about allowing each at least some compensation—because a representative of either side who is not bereft of his senses must know that the other side is not going to work for nothing.

The foregoing indisputable statements of *fact* are equally applicable to every other private industry and to private industry as a whole. The refusal of a majority of the voters in this country and of those they have placed in power fully to accept these *facts* and act in accordance with them is responsible for the unprecedentedly protracted failure of recovery, the present small volume of production and construction and the consequent small volume of freight traffic. Those in power have tried to increase both wages and employment by measures tending directly to curtail the investment of capital and even to destroy capital already invested. But capital and labor must work *together* in every industry, or neither can work at all; and the amount of capital put and kept at work determines how much labor can be put and kept at work. Consequently, every measure curtailing the amount of capital at work has curtailed employment in private industry, including the railroads.

Irrefutable Economic Evidence That Labor Is Overpaid

Now, from a standpoint of how much *must* (not *ought*) be paid to capital and how much *must* be paid to labor in order to induce them to collaborate to keep the railroads going, what is the evidence? Is either capital or labor backward about going into the railroad business today—and, if so, which of them is backward and why? Let us take a look, first, at labor. Is there any shortage of men willing to work on the railroads? Was there any such shortage before wages were advanced last year? Would there be any shortage after wages were reduced 15 per cent? Of course, the answer is entirely to the contrary. There are hundreds of thousands of experienced men now unemployed who would gladly go to work for the railroads at much smaller wages than are now being paid. Plainly, the wages the railroads pay at present are higher than they need be to attract all the labor required to keep the railroads in operation. Any payment in excess of the going market rate is overpayment in the economic sense of the term. Present wages are bound to represent overpayment, because they are higher than they have ever been in history at a time when, probably, more men are seeking work than at any previous time in history. If present wage rates are justifiable at all, it must be upon moral, not economic grounds.

How, then, about the supply of capital? Is new capital coming into the railroads, or seeking to come in, to replace that which is constantly being worn out, and to provide the improvements needed to keep railroad service up-to-date to meet competition? Of course it is not. An occasional few millions here and there for badly needed rolling stock represents *all* the new money which is being currently invested in the railroads. And this slight new investment is being far more than offset by the railway facilities which are being abandoned and junked. In other words, railroad plant is shrinking for the lack of new capital; and, as railroad plant shrinks, its job-giving power shrinks also.

Capital's Wage 84 Per Cent Under "Going Rate"

Have the "wages" being paid to capital anything to do with this shrinkage? Of course, they have everything to do with it. The "prevailing wage" of capital in the general investment market is, probably, around 4 per cent. The "wage" earned for capital invested

in the railways during the first half of 1938 was about ⅔ of 1 per cent—or about 84 per cent under capital's "prevailing wage." New capital will not go to work at wages 84 per cent under capital's "prevailing wage," any more than labor would go to work at wages 84 per cent under the prevailing rate for labor. If the customary wage for labor in a community were $4 a day, what chance would anybody have of inducing men to go to work for 67 cents a day? Yet that is, by comparison, exactly all the inducement that the railroads are now able to offer to capital. And the result is that they are not getting the capital. It goes without saying that, as the capital inflow dries up, the railroad industry must dry up with it.

Those who argue on moral grounds (and they cannot argue on economic grounds) that present wage rates are justified, had better explain how they propose to keep the railroads going without any new capital. That is to say, can a wage rate be defended upon moral grounds when it is so high that it is forcing reduction of the capital and physical facilities of an industry and tending to make the industry paying it incapable of paying any wages whatsoever? The union leaders, from a moral standpoint, are in the same position as Old Shylock. They want their pound of flesh—and, superficially, they can present some plausible arguments to justify their demand—but they have not got the right, on moral or economic grounds, to let out the life blood of the industry when they try to collect. And that is exactly what they do when they try to cut down the compensation of capital to a point where capital disappears.

Mr. Harrison's $14,000,000,000 Fallacy

The paragraphs above do not comprise a partisan argument for "capital" and against "labor." They are merely a statement of objective fact, the truth of which cannot be disputed by any intelligent person, regardless of his partisan sympathies. If both capital and labor were available to the railroads in adequate volume at the current "wages" being paid to each, and if the railroads still had some money left over to divide, there might be grounds for moral argument as to how the residue of money should be divided. But there is no such residue—and the evidence is plain that labor is being paid more than is necessary to attract it to railway service and that capital is being paid less than is necessary so to attract it. Against these irrefutable facts, the only arguments the labor executives are able to advance against a 15 per cent reduction in wages stand out in all their puerility. Said George M. Harrison at the wage discussion in Chicago:

"The record shows that $14,000,000,000 has been taken out of the railroad industry in 17 years, from 1920 to 1937, in interest and dividends, and it seems to us that the people who have so greatly profited from the industry should be the ones you should look to now to help you solve your financial problems."

Get that word *"should."* Mr. Harrison is arguing his case purely on moral grounds—as if people with money to invest will put it where it is unsafe and will earn them next to nothing simply because he scolds them and tells them they *ought* to do so. Mr. Harrison is too intelligent a man to fool himself with such a fallacious argument—and it is certainly regrettable that political conditions within the labor unions make it expedient for him to attempt to fool others with it.

Propaganda No Substitute for Return

It so happens that in the years 1920-37 aggregate compensation of railroad employees chargeable to operating expenses alone (and omitting wages paid which were chargeable to capital account) totaled almost 44 billion dollars. Mr. Harrison says the railway investors who received 14 billions in the years 1920-37 "ought" to pull the roads out of their present difficulties, so that the employees who received 44 billions in the same period of time may be spared the necessity of making any present sacrifice whatsoever. Fourteen billion dollars is a lot of money; but as representing the 1920 to 1937 return on an average investment of 25 billion dollars in railroad property, it figures out to only a little more than 3 per cent a year, which surely Mr. Harrison cannot consider an exorbitant "wage" for capital.

But these citations of what railway investors and railway labor have earned in the past have no practical importance. Even if railway investors had received twice the 14 billion dollars which Mr. Harrison says they were paid from 1920 to 1937, it would not mean that they would invest their money with the prospect of no return at all today or in the future. Railway labor has received average compensation per employee in the past 10 years ranging from slightly below $1,500 to more than $1,700 per annum. Does that mean that employees would be or ought to be willing to work today for $200 or $300 a year? Of course, it means no such thing. No amount of exhortation would convince the employees that they "ought" to work for less wages than they could receive in some other industry. And likewise, no amount of oratory about how much compensation railway capital has received in the past will convince it that it ought to go to work today for the railroads at "wages" 84 per cent lower than it can get elsewhere.

Calling a Lender Names Will Not Get His Money

But without an inflow of new capital the railroads must perish—and with them will go the jobs that they otherwise would provide. There is no moral "ought" at issue when it comes to hiring capital. If the railroads could get all the new capital they need to keep their industry up-to-date at the present rate of return of ⅔ of 1 per cent, there could be no cause for complaint. Capital is not "entitled" to a return any greater than is needed to attract it. Conversely, to criticize it

on moral grounds for refusing to go to work for the railroads at less safety and at a lower "wage" than it can command elsewhere is merely a futile gesture.

The railways and their employees are up against the hard economic fact that the railways are not paying capital enough to attract it into railway investment, and the further fact that the railways and railway jobs cannot exist without such investment. And they are faced also with the fact that present railway wages are much higher than the "prevailing rate" in the labor market. Bringing down railway wages more nearly to the "prevailing" level would permit the payment of something, at least, to capital; and would attract some new investment into the railroads. And with new investment, there is bound to come greater employment of railway workers.

As it is now, the union leaders have not only milked the old cow dry, but they have begun to carve steaks off her flanks. Maybe the "old heads" who have only a few years to go until they retire may not lose by thus killing off their means of livelihood, but certainly everyone else in the industry will lose by it. And the principal losers will be the junior employees. They are the ones whom high wages have deprived of jobs now—and they are the ones who will be deprived of jobs in the years to come, if the railroads continue to lose their competitive power by reason of undermaintenance and lack of capital to keep their service up-to-date.

Is "Kicking Against the Pricks" Good Politics?

As we said above, we believe the railway union leaders are as much aware of these facts and their obvious implications as we are. They are not acting upon them because they believe it politically inexpedient to do so. But political expediency cannot detour very far or very successfully around hard economic reality. President Hoover signed the Hawley-Smoot tariff act against the advice of virtually all the competent economists of the country in 1930; with exactly the disastrous results to the nation—and to the political fortunes of himself and his party—that the economists sought to prevent. The attitude of the railway labor leaders in the present wage case, in its flaunting for political reasons of obvious economic realities, is an exact parallel of the political behavior of President Hoover and his entourage in 1930. And will, if adhered to, prove just as disastrous—to themselves, as well as to thousands of innocent persons.

The Roosevelt administration for five years has been trying to reform the economic system and cause recovery with policies inspired by political or supposedly moral motives; but general business and unemployment are as bad now as five years ago, and may finally produce political effects like those that caused disaster to the Hoover administration. Fortunately for the railway industry and its future, the labor leaders do not have the final say as to what railway wage rates shall be. If they will not listen to reason, then courageous managements with the aid of employees who recognize their union leadership for what it is, can go ahead and make the necessary adjustments anyhow. And the blame for the conflict will rest squarely on those who by their wanton bull-headedness made it inevitable.

An Achievement and An Opportunity

The railways are the largest industrial users of forest products. They spend more for ties, lumber and allied products than for any other similar group of materials except fuel. In normal years, their purchases exceed $170,000,000, taking 20 per cent of the entire cut of the forests. For this reason the railways have a very definite interest in the centennial of the birth of wood preservation, as we know it today, that is being recognized this year.

While the importance of arresting decay in wood had long been recognized and some steps had been taken to accomplish this result, the granting of a patent on July 11, 1838, to John Bethell for a process involving the use of pressure for injecting preservatives into timber, marked the beginning of commercial wood preservation as we know it today—a development that has saved the railways hundreds of millions of dollars to date and that is saving them more than $150,000,000 a year now.

In fact, for a long time the railways were the only industry that recognized the possibilities of wood preservation and gave encouragement to its development when other wood using industries ignored or openly opposed it. Furthermore, the railways are still the strongest advocates of wood preservation, using more than two-thirds of all the timber treated by pressure processes today.

Wood preservation possesses a unique appeal to the railways. By reason of their large use of timber, they are interested in the maintenance of an adequate supply. By reason of the magnitude of their purchases, they are interested also in means for securing the maximum life from the timber bought for various purposes. Wood preservation contributes to both of these considerations.

The wide acceptance of treated timber by the railways refutes a criticism frequently directed at them to the effect that they are price buyers, giving sole or undue consideration to the first cost of a product. Treated timber costs more than untreated timber; furthermore, it yields little or no return until after the normal life of untreated timber is reached, usually at least seven or eight years. That the railways have been willing, through the years, to make the added expenditures necessary to secure treated timber constitutes an excellent example of their willingness to pay more for a product when convinced that this added expenditure will yield an adequate return.

Great as has been the acceptance of treated timber

by the railways already, and great as have been the economies effected thereby, the railways still offer the largest undeveloped market for further utilization of treated wood for the myriad of purposes for which wood is still utilized. By reason of the wide use of treated wood already, the railways need no further proof of the adequacy of treatment. From the standpoint of the commercial treating companies, the railways offer a concentrated market, with sales contacts already established and with full acceptance of the merit of the product. That these additional markets are still undeveloped is due to the inertia of railway users of timber and of commercial treating companies alike. It is to be hoped that the information published on following pages, supplemented by the stories of the services offered by the more alert commercial companies in the field, may awaken railway officers to the further economies available to them from the more universal treatment of timber.

Organize the Security-Owners

In politics it is both numbers and organization that count. There are 91 presidents of Class I railroads. There are about 930,000 employees. Every important controversy regarding wages or working conditions, whether arising under the Railway Labor Act or because of proposed legislation, gets more or less into politics. The ratio of presidents to employees is 1 to 10,000. It is plain which side in a controversy has the greater political influence. Similarly in a rate controversy, which is always more or less political, the railway presidents always are greatly outnumbered by the shippers opposing them. To the existence of this political situation throughout the thirty years of effective regulation is largely or mainly due the present greatest crisis in the history of American railroads.

There are 2,000,000 railroad stockholders and bondholders. This great body of security-owners has never been adequately organized in its own defense. In its interest the railway executives have year after year fought a losing political battle. Had investors been adequately organized the railroads would not be in their present plight.

Railway managements, through the Association of American Railroads, have worked out a clear cut, comprehensive legislative program. The future of the railroads is largely dependent upon its passage. But 91 presidents cannot unaided overcome the political pressure of railroad employees, water and motor carriers, regulatory and taxing bodies and many shippers each of whom probably will oppose various measures included in the program and be backed by politicians in doing so unless strong counter political pressure is brought to bear.

To whom, unless their 2,000,000 security-owners, can railway managements look for effective backing in this crisis? Recently railroad investors have been organizing themselves. In six states they already have been mobilized, on the initiative of the National Conference of Investors, into state associations or units, and preliminary work for forming similar associations or units is under way in most of the other states. For the first time the voices of investors throughout the country promise to be heard in their own defense.

State units are being formed because it is only home folks and home influences that count with Congress and public agencies. Each state unit is to be under the direction and control of its own officers and governing board; each county is to be represented on the state governing board and each state on the national board, so there may be co-ordinated action among them. Each state unit is to raise and disburse its own funds, retaining two-thirds of its membership dues for local activities and paying one-third to the central board for its work of co-ordination and representation before congressional committees, commissions and boards.

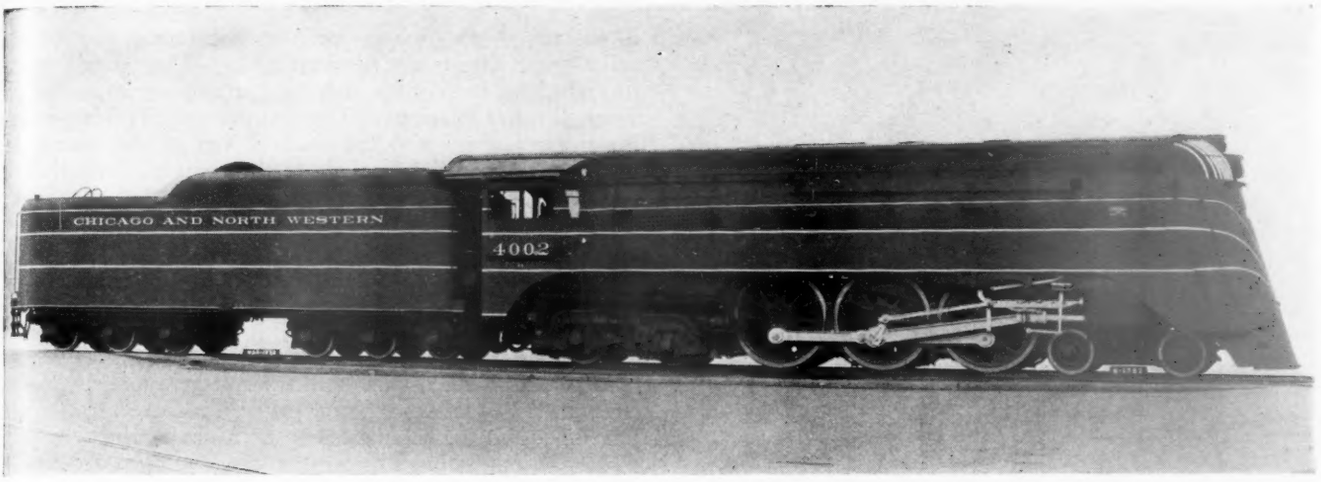
If given the support to which it is entitled, this investor movement may well be the difference between losing and saving private ownership of railroads. Many railroads are on the verge of disaster; all are in serious circumstances. Railroad managements have a definite program. If managements and investors will co-operate, they can save their properties.

But each must support the other. Investors must recognize that those who have spent a life-time in the management of their properties know their needs. They must unitedly back the legislative program to which the managements are committed. Through their force of numbers, their influence with their congressional delegations, their newspapers and commercial organizations —through their friends and business associates—they must fight for this program.

But managements, too, have a similar duty. They must support their investors. To succeed, each state unit must have the best managerial and organization talent procurable—the best publicity talent, the most effective advocates in Washington.

The investors are organizing on the verge of a decisive battle. They have no time for a long campaign of education to induce all investors to enlist in this cause; but managements, through their influence and connections, can secure the united backing which is vital to this mutual undertaking. Each railroad president should take responsibility for securing support of the investors' movement by his own security holders. He should join himself, and see that every director and large stockholder becomes a member. He should try to see that every institutional holder of the bonds of his railroad supports this worthy movement.

The need is pressing. The legislative program is sound and comprehensive. Force of numbers alone will achieve success. Much more support than that of both managements and security-owners will be needed; but organized action by security-owners in every part of the country will be required to get the additional public and political support required.



C. & N. W. 4-6-4 Type Passenger Locomotive Built by American Locomotive Company

Streamline Locomotives For the Chicago & North Western

Passenger power develops 55,000 lb. tractive force and weighs 412,000 lb.—These locomotives among largest of type built to date

THE Chicago & North Western placed nine new 4-6-4 heavy passenger locomotives in service between Chicago and Omaha, Neb., during March and April of this year. These locomotives are among the largest of their type to date and were built at the Schenectady, N. Y., plant of the American Locomotive Company. Eight of them are regularly assigned to the San Francisco and Los Angeles "Challengers," the San Francisco "Overland Limited" and the "Pacific Limited." The ninth unit is used to provide for special operating occasions. The nine engines are now averaging about 14,000 miles a month. The larger fuel and water capacity make it possible to eliminate three stops between Chicago and Omaha as compared with the older power previously used on these trains. The trains handled range from 10 to 18 passenger and Pullman cars.

These locomotives have a weight on drivers of 216,000 lb., a total engine weight of 412,000 lb. and a total engine and tender weight of 772,000 lb. The boilers have a combined evaporative and superheating surface of 5,863 sq. ft. and carry 300 lb. pressure. The tenders have six-wheel trucks and a coal and water capacity of 25 tons and 20,000 gallons, respectively.

The Boiler

The barrel of the boiler is in three courses, the inside diameter of the first course being 88 3/16 in., the second 90 1/16 in., and the third 92 in. The thickness of the plate of the first course is 15/16 in., the second 31/32 in., and the third 1 in. Nickel steel, furnished by the Bethlehem Steel Company, is used for the shell-course plates, welt strips and liners. The dome and safety-valve turret opening is located in the second course. The dome is 40½ in. inside diameter and is flanged from a single piece of plate. The front tube sheet is ¾ in. thick and the back tube sheet 9/16 in. The firebox is 157 1/32 in. long inside and 83 3/16 in. wide inside. The combustion chamber is 31 in. in length. The firebox is arranged for bituminous coal, using pin-hole type, cast-iron rocking grates.

The roof sheet is of nickel steel furnished by Bethlehem, while all the rest of the flanged sheets in the firebox and combustion chamber are of Lukens open-hearth steel. The roof sheet is 13/16 in. thick, while the outside side sheets are 9/16 in. thick. All of the inside firebox sheets are 13/32 in. thick. The water space at the mud ring is 5 in. at the sides and rear and 5½ in. at the front.

Welding has been used on the inside throat sheet and back tube sheets. Sealing welds have been used at the back mud-ring corners of the firebox to a height of 10 in. from the bottom of the mud ring. The fire-door opening between the back head and inside back firebox sheet has been welded. Welding has also been employed at each end of all longitudinal seams in the shell of the boiler for a distance of 12 in. from the end of the seam. An extensive application of Alco telltale type flexible stays has been made in the fireboxes of these locomotives. Flexible stays using WZ type sleeves have been used in the throat sheet and two outside rows of the back head. Flexible radial stays with WZ sleeves have been used extensively in the firebox sides and crown sheet, except where expansion stays are used in the combustion chamber area.

The brick arch in the firebox was supplied by American Arch Company and is supported on two arch tubes and the two Thermic syphons. Four combustion tubes are located in each side of the firebox. The inside fire-

The Front End

box side sheets are corrugated between 27 staybolt rows. The corrugations are formed on a radius of 1¾ in. to a total depth from peak to valley of ½ in. Where the combustion tubes pass through the inside firebox the sheet is flattened over a sufficient area to permit beading the tubes. The boilers are equipped with the Barco Type F3a low-water alarm, Superior flue blowers and Wilson blow-off cocks and mufflers. The fire door is the Franklin Butterfly type. Fuel is fed by means of a Standard type BK stoker. The stoker engine is located on the tender.

Water is fed to the boilers by means of a 6,500-gallon Hancock non-lifting injector on the right side and an Elesco No. 3 exhaust-steam injector on the right side. The saturated steam passes through a Tangential steam dryer in the dome to the Type E superheater and is controlled by an American multiple throttle built into the superheater header.

The ash pans are of steel plate, welded at the joints.

Engine Bed and Running Gear

These locomotives are equipped with the General Steel Castings cast engine bed with cylinders, back cylinder heads, link-support and guide-yoke brackets and air-pump brackets cast integral. The boilers are supported on expansion shoes at all four corners of the firebox. A waist-sheet crosstie is located at the reverse-shaft support and between the second and third pairs of drivers.

The engine trucks are the General Steel Castings four-wheel type with 37-in. rolled-steel Bethlehem wheels and A. S. F. roller-bearing units. The driving wheel centers are 76 in. in diameter and are the Boxpok type. The driving axles are equipped with Timken roller bearings with one-piece housings. The journal diameter is 13.008 in. at the main wheel and 12.008 in. on the front and back drivers. The diameter of the drivers over the tires is 84 in. Graham White sanders are applied.

The trailing truck is the four-wheel Delta type furnished by the General Steel Castings Corporation, with 37-in. rolled-steel wheels on the front axle and 45-in. rolled-steel wheels on the rear axle. The wheels were furnished by Bethlehem and the journals are mounted in Timken roller bearings. The diameter of the front trailing-truck journal is 6.254 in. and that of the rear axle 7.004 in. Provision is made in the design of the trailer truck for the future application of a booster.

The cylinders are 25 in. by 29 in. and the piston valves on seven of the engines are 12 in. diameter, while the remaining two have 14-in. valves. Cylinders and valve chambers are fitted with Hunt-Spiller gun-iron bushings, piston and valve bull rings and Hunt-Spiller Duplex piston- and valve-packing rings. The piston heads are the Z type, of rolled steel, and the rods are nickel-carbon steel 5 in. in diameter. The piston rods are fitted with Paxton-Mitchell packing. The multiple-bearing type of crosshead is used. The guides are equipped with the Alco Slidguide attachment.

The main and side rods are nickel-carbon steel, normalized, quenched and drawn. Floating type bushings are used both in the main and side rods.

The weight of the reciprocating parts on each side of these locomotives is 1,720 lb. The amount of overbalance at each wheel is 201 lb. and the dynamic augment is 4,910 lb., 8,750 lb. and 13,660 lb. at 60, 80 and 100 m. p. h., respectively. The revolving weights are cross counterbalanced in all wheels.

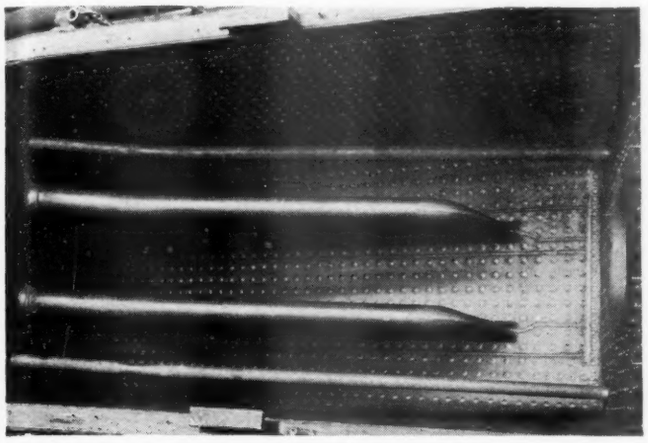
Steam distribution is controlled by Baker valve gear actuated by a Barco type M-1 power reverse gear mounted on a bracket secured to the boiler shell.

Force-feed lubrication is used on cylinders, valves, guides, valve-rod guides, engine-truck, driving-box and trailer-truck-box shoes, engine-truck center pin and trailer-truck fulcrum. Two Detroit 32-pint lubricators, one

General Dimensions and Weights of the C. & N. W. 4-6-4 Type Streamline Locomotives

Railroad	C. & N. W.
Builder	American Locomotive Co.
Type of locomotive	4-6-4
Road class	E-4
Road numbers	4001-4009
Date built	1938
Service	passenger
Rated tractive force, engine, 85 per cent, lb.	55,000
Weights in working order, lb.:	
On drivers	216,000
On front truck	87,000
On trailing truck	109,000
Total engine	412,000
Tender	360,000
Wheel bases, ft. and in.:	
Driving	14- 8
Engine, total	42- 4
Engine and tender, total	88-11¾
Driving wheels, diameter outside tires, in.	84
Cylinders, number, diameter and stroke, in.	2-25 x 29
Valve gear, type	Baker
Valves, piston type, size, in.	(7) 12 (2) 14
Maximum travel, in.	7¾
Boiler:	
Steam pressure, lb.	300
Diameter, first ring, inside, in.	88⅜
Firebox length, in.	157⅛
Firebox width, in.	83⅜
Combustion chamber length, in.	31
Arch tubes, number and diameter	2-3½
Thermic syphons, number	2
Tubes, number and diameter, in.	8-2
Flues, number and diameter, in.	196-3½
Length over tube sheets, ft.-in.	19-0
Fuel	Bituminous coal
Stoker	Standard BK
Grate area, sq. ft.	90.7
Heating surfaces, sq. ft.:	
Firebox	367
Arch tubes	21
Syphons	119
Firebox, total	507
Tubes and flues	3,472
Evaporative, total	3,979
Superheating	1,884
Comb. evap. and superheat	5,863
Tender:	
Style	Rectangular
Water capacity, U. S. gallons	20,000
Fuel capacity, tons	25
Trucks	Six-wheel

of 10 feeds and the other of 16 feeds, are applied on the right and left sides, respectively. Both are driven from the top end of a combination lever. A Nathan six-pint, four-feed hydrostatic lubricator takes care of the air



The Interior of the Firebox—The Arch Is Supported on the Syphons and Two Arch Tubes

pumps and stoker engine. Alemite lubrication is used on the main and side rods.

The brakes are the Westinghouse Schedule 8-ET. Two 8½-in. cross-compound compressors are mounted on a bracket cast integral with the bed back of the bumper beam. Air reservoirs of 60,000 cu. in. capacity are cast in the bed. Independent brake cylinders are used for driving and trailer brakes. The entire engine brack rigging, as well as the spring rigging, is fitted with Ex-Cell-O pins and bushings.

A type E coupler with 6-in. by 8-in. shank, furnished by National Malleable & Steel Castings Company, is used on the front of the locomotive together with A. S. F. steel coupler yoke. The Franklin Unit Safety bar is used between engine and tender.

Piping

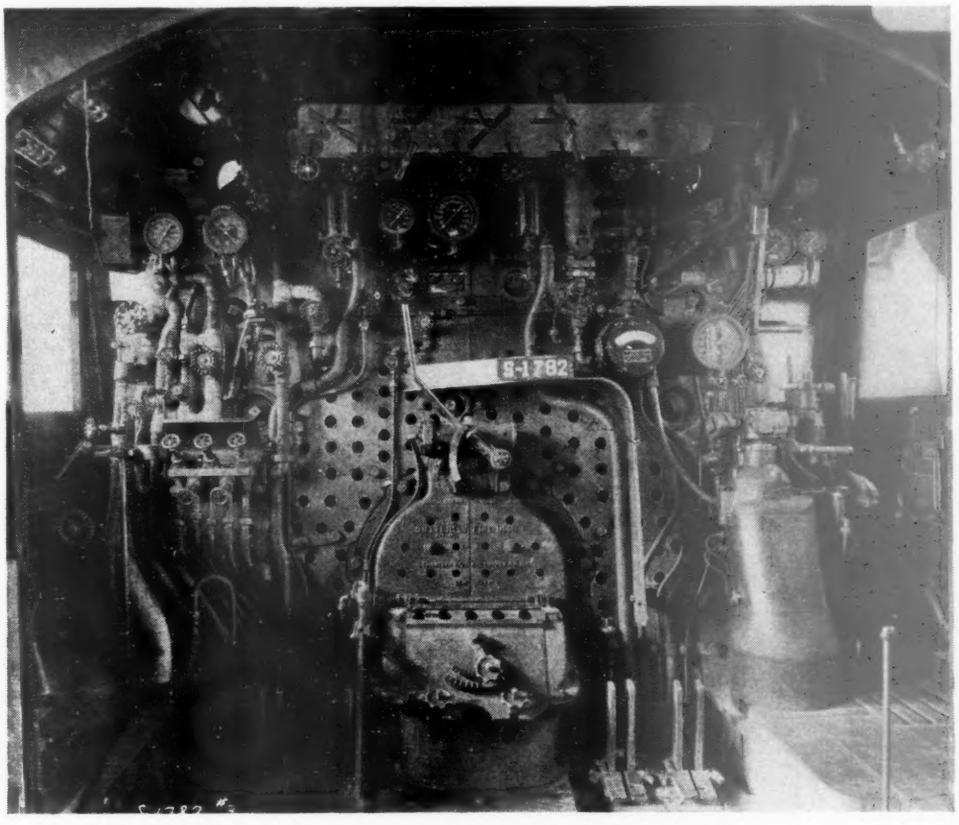
An interesting feature of the locomotives is the arrangement of the saturated-steam piping designed to eliminate the cab turret. Just ahead of the front of the cab there are three main steam valves connected to three dry pipes, inside the boiler, from the dome. Two of these are 2½-in. Hancock angle valves, one for the right injector and the other for the exhaust-steam injector on the left side. A third 2½-in. Hancock angle valve feeds into a 2½-in. manifold at the end of which is the steam-heat shut-off valve and pressure regulator. From the manifold itself there are two outlets, one a ¾-in. pipe to the cylinder cocks and the other a 1-in. nipple to a 1-in. by ¾-in. by ½-in. tee in another manifold made up of pipe and fittings. This has four outlets,—two ½-in. connections to the injector and lubricator heaters and two at the opposite end of ¾-in. size to the coal sprinkler and headlight generator. The superheated-steam line to the blowers, air pumps, whistle, coal pusher and smoke consumer, is arranged in the conventional manner with the take-off from the superheater header.

The steam heat equipment was furnished by Vapor Car Heating Company with Barco steam heat connections. Barco flexible connections are also used between engine and tender.

Streamlining

These locomotives are covered with a shroud which was designed to provide a pleasing appearance and to offer the least interference with inspection and maintenance. No. 14-gage material has been used on the front end and sides and No. 16 gage on the top cowling. Three red stripes run along the sides of the entire en-

(*Continued on page 324*)



Arrangement of the Cab and Back Head

Preservative Treatment, Preceded by Accurate Preframing, Is Giving Structures Like This a Life of 30 Years or More Today

Wood Preservation — and the Railways

A review of a relationship that has saved the carriers hundreds of millions of dollars

ONE hundred years ago—on July 11, 1838—a patent was issued to John Bethell covering the pressure process for the treatment of timber to protect it against decay and thereby extend its life. From that beginning there has developed an industry that, in the United States, includes more than two hundred plants which treated 265,000,000 cu. ft. of timber in 1937.

The wood preserving industry is essentially a railroad industry. It was developed to meet the needs of the railways for more durable timber for crossties and more recently for structural purposes, for poles and piling, for crossing plank and for a wide variety of miscellaneous uses, including a slight amount for freight car construction. In the early years of the industry, the railways took almost its entire output; they still take two-thirds today.

At one time the railways owned and operated a large proportion of the wood preserving plants. They still own some 35 plants and operate 23, although the present trend is definitely towards the leasing of these plants to private parties for operation.

By reason of the fact that timber comprises one of the largest items of railway purchases and the further fact that the wood preserving industry has always looked and must continue to look to the railways for its major market, the interests of these two groups are mutual. For this reason it is entirely natural that the *Railway Age* should recognize the centennial of wood preservation, dating from the granting of the Bethell patent, for this action marked the beginning of a development that has already saved the railways hundreds of millions of dollars and can save them many millions more as the possibilities for treated timber are more universally realized.

The nature of this development, the part that the railways have taken in it, the economies that have already resulted therefrom and the further economies that are possible as the treatment is extended to those applications where timber is still used untreated, are presented in the pages that follow.

A Development of Last Century

As far back as history goes, man has used wood for constructive engineering purposes. Yet it was recognized from earliest times that it was subject to decay, sometimes very quickly, which sooner or later caused partial or complete failure of the structures in which it had been applied.

Classical literature contains many references to efforts to prevent decay in timber and to the substances that were employed for this purpose. Among the earliest of these were asphalt, tar and pitch, which were used for coating the wood surfaces. Observing that cedar, larch, juniper, nard, and certain other trees and shrubs were resistant to decay and the attack of insects, and that these woods contained either resins or highly scented oils, means were devised for extracting them and they were applied to the timbers of important structures, and

to wooden objects of value, in the belief that they would ward off decay and the attack of insects.

Further developments in the art of wood preservation ceased with the beginning of the Christian era, and for 1,700 years there was apparently little curiosity concerning the causes of decay; at any rate not sufficient to stimulate serious study. About the beginning of the Eighteenth century, fermentation and putrefaction began to attract attention and, although some of the early theories with respect to these phenomena seem absurd in the light of modern knowledge, this period marks the beginning of progress in the control of decay in wood.

How Wood Preservation Got Its Start

Although the causes of decay were still unknown, these studies were soon extended to include antiseptics, and while a number of experiments are recorded, one of the earliest practical applications was that of Homberg, a French scientist, who, in 1705, steeped wood in corrosive sublimate to protect it against insects. While much activity in the way of research, and particularly in the propounding of theories, can be traced through the records of the Eighteenth century, it was not until the beginning of the Nineteenth century that practical progress in wood preservation became evident.

Two factors were responsible for this advance. At that time, England was engaged in a life-and-death struggle with a host of adversaries, in which her very existence depended on her navy and her merchant marine. Yet decay in the timbers of her ships was taking a heavier toll of both her fighting and her cargo vessels than all of her enemies combined. Later, with the birth of the railway, conservation of the timber employed as sleepers immediately became an engineering as well as an economic necessity, for timber was by no means plentiful in England.

For these reasons, what had previously been looked upon as more or less an academic problem, suddenly became a very practical one and technical progress had its start. Kyan's patent, issued in England in 1832, probably was the greatest step in the art of wood preservation up to that time, and for some time his process was by far the most popular method of treating timber. But it had two serious defects; it was expensive and poisonous and could not be made to penetrate deeply by merely soaking the wood in a solution, and it had limited usefulness, being ineffective against marine borers; and the slowness of the process made it applicable for treating timbers on a small scale only. In its day, however, it was an important advance in the technical development of the art of wood preservation.

Bethell Made Greatest Contribution

The most important technical development in the art occurred in 1838, when John Bethell took out his patent covering the pressure process for treating wood. Despite the fact that this patent covered a process rather than a preservative, 18 substances being listed as preservatives to be used with the process, and despite the further fact that there was only incidental mention of creosote, this invention became the origin of the modern treatment of timber with creosote.

In the same year, 1838, Sir William Burnett, who had been director general of the medical department of the British navy, obtained a patent covering chloride of zinc as a preservative for wood. The original method of treatment consisted of boiling the wood in a solution of chloride of zinc, made in the proportion of ¼ lb. of dry salt to 1 gal. of water. This proved to be very slow and tedious and not very effective, and Burnett shortly adopted Bethell's pressure process. His process was still further improved by using steam to prepare the wood for the reception of the preservative.

Passing over literally thousands of experiments with hundreds of substances and the numerous patents that were issued to cover processes of almost every conceivable kind, by 1850 only four of these processes and preservatives remained in common use in England, where up to that time the greatest practical technical advances had been made and where the largest volume of wood was being treated. These were Kyanizing; Margaryizing, in which sulphate and acetate of copper constituted the preservative; Burnettizing; and creosoting. Several other preservatives were still employed on the continent, but they too fell into disuse, generally, in the course of time.

Early Developments in the United States

In the early days of the railways in the United States, timber was so plentiful and cheap that little thought was given to wood preservation, and for this reason the growth of the wood-preserving industry in this country was slow. While sporadic experiments were conducted, beginning with 1838, and a considerable number of treating plants were constructed during the following four decades, the construction of a treating plant by the Louisville & Nashville at West Pascagoula, Miss., in 1875, to creosote timbers exposed to teredo attack, may be said to mark the beginning of wood preservation in an organized way in this country. Although there was a marked expansion in the use of treated wood, and a considerable number of plants were constructed from that time until 1900, the methods employed generally followed European practice, so that during this period there was little advance along technical lines.

This should not be interpreted to mean that wood preservation was at a standstill with respect to either processes or research. The industry was expanding, but the art was so new in this country and there were so many factors demanding consideration that practice was outstripping knowledge, as it had done in England during the three or four decades previously. Again, this country not only had a greater variety of woods to draw from, but a wider range of conditions under which they were being used than had faced the industry in Europe. For this reason, there was little experience that could be drawn upon as a guide to the development

The First Creosoting Plant in the United States, Built by the Dighton & Somerset at Somerset, Mass., in 1865, Is a Far Cry From the Treating Facilities of Today

of methods best suited to the conditions that were being faced in this country. Furthermore, the causes of decay were only beginning to be understood, and in some respects had not yet been fully established.

It is not surprising, therefore, that as the use of treated wood expanded, many examples of unsatisfactory service occurred, and that questions concerning methods, adequacy of treatment, seasoning, preparation of the wood for treatment, character and dependability of the preservatives, penetration and retention of preservatives, their adaptability for different woods and precautions to be taken after the wood was in service, as well as many others, began to arise. All of these and other features connected with the art were investigated, but facilities for intensive research had not yet been built up. Furthermore, in many cases, when a new process or an improvement on an old one was devised, it required years to determine whether it gave satisfactory results. Sometimes valuable information relating to the results of these treatments was allowed to slip away through failure to keep proper records of service.

Industry Struggled for a Foothold

Another factor which must be kept in mind when considering the technical developments which have resulted in permanent improvements in the art of wood preservation in this country, is that during the early period of the industry timber was plentiful, and in many quarters it was considered to be cheaper to use untreated wood and allow decay to progress without artificial hindrance, than to pay the cost of preservative treatment, even though this treatment would extend the service life of the timber two or three times. For these reasons, much time and effort during this period were directed toward the discovery of cheaper antiseptics; toward finding combinations of those already in use, that would reduce the cost of treatment; toward devising means whereby the desired results could be attained with reduced amounts of preservatives; and to the possibility of shortening the time of treatment. While some of these studies were undoubtedly constructive, to some extent they tended to retard real advances in the technical developments of the art of wood preservation.

In the course of time it became apparent that some of the practices which had been successful in Europe and which had been copied in this country were not giving satisfactory results. It required some time and serious study to discover that the reason for this was that in Europe only seasoned timber was given preservative treatment, while here much of the material was freshly cut or only partially seasoned when it entered the retorts, and that entirely different methods would be necessary. Methods for the artificial conditioning of the green wood were devised as a consequence of this discovery and this marked a further definite technical advance, although the ultimate development along this line has not yet been reached.

Although the widespread interest in wood preservation stimulated chemists and inventors to develop an astonishing number of antiseptics and processes for the preservative treatment of wood, in a comparatively short time the bulk of the preservatives in common use had narrowed down to creosote and zinc chloride, although these were combined with other substances in some of the processes, and pressure treatments eventually came to be used almost exclusively, except for poles and posts for which the open-tank method is still employed to some extent.

Efforts Made to Reduce Costs

While both creosote and zinc chloride were demonstrated to be highly effective in preventing decay, the former was the most expensive of all preservatives that had been used to any extent; and the latter, among the least expensive, had the disadvantage of solubility. In an effort to reduce the cost of creosoting and at the same time obtain the full advantage of preservative treatment, several processes were devised which represented technical developments of considerable importance. The first of these, suggested by J. P. Card, consisted of a light injection of creosote, followed immediately by a normal injection of zinc chloride. It was claimed for this process that the interior of the timber would be fully protected against decay by the preservative salt and that leaching would be prevented by the creosote.

This Plant, Built in 1937, Illustrates the Latest in Facilities for Treating Timber for Railway Uses

Another method, known as the Allardyce process, which had the same purpose, that is, low cost and prevention of loss of the zinc chloride, reversed this process, since it consisted of a full treatment with zinc chloride, followed immediately by an injection of about 3 lb. of creosote. A third zinc-creosote process, widely known as the Card process, was introduced somewhat later by J. P. Card, son of the inventor of the first process. This differed from the Allardyce method in that an emulsion of the creosote and the zinc-chloride solution was injected into the wood in a single operation.

The Wellhouse process also marked another step in the technical development of wood preservation at a time when the industry faced the necessity of keeping its cost low to permit it to compete with low-priced

untreated timber. This process consisted of a normal injection of a solution of zinc chloride, mixed with glue, followed by the injection of a solution of tannin, the theory being that the glue and tannin formed an insoluble compound which filled the pores of the wood and kept the zinc chloride from leaching. Later this became a three-movement process which required considerable time and involved much inconvenience.

As the supply of timber dwindled, and practically disappeared in some sections, prices advanced to the point where higher costs for treatment could be justified. Up to this time the Bethell, or full-cell, process had been employed universally for the straight creosote treatment. Then, as now, ties constituted the bulk of the timber treated, but as there was no well-developed means for protecting them from mechanical damage in service, a large percentage failed from this cause long before their service life would have been terminated by decay.

The Louisville & Nashville Plant at West Pascagoula, Miss., Built in 1875, Marked the Beginning of Wood Preservation in the United States As It Is Known Today

New Processes Developed

For this reason, the belief grew that creosoting was an uneconomical process, since a considerable part of the cost of the treatment was lost through early mechanical destruction of the ties. At this point two methods of treatment came into use, which represented distinct advances in technical development and which have had a profound influence on wood preservation. These are known as the Lowry and the Reuping processes, designed to give the same penetration of the wood as the full-cell process, but reducing the amount of creosote retained by expelling some of it by means of air compressed in the wood cells.

From the beginning, ties treated with zinc chloride gave trouble from checking and splitting, particularly in the arid regions of the West and Southwest. To overcome this difficulty, a method was developed in which the treatment with zinc chloride was followed by an injection of petroleum. While this was successful in part, and a considerable number of ties were treated in this manner, further developments led to the adoption of other methods, for while the cost of the preservative and the oil was low, the double treatment slowed down the output from the retorts.

In the beginning Bethell used coal tar as a preservative, but was unable to inject a satisfactory amount into the wood. He then tried "dead oil of tar" or creosote as a thinner. Later, coal tar was used as a diluent for the creosote to reduce the cost of treatment, and this practice is being followed to a large extent today; although coal tar alone is still in use for preserving wood. The most recent development in the dilution of creosote when used as a preservative is the addition of petroleum to produce mixtures in which the proportions of the constituent oils are varied to correspond with the kind of wood, the purpose for which the timber is to be used, considerations of the cost of treatment and other factors which may be taken into account.

It was early recognized that creosote is a complex and variable substance, and for many years controversy raged as to the preservative value of the light and heavy constituents of the oil; in fact, this discussion is still in progress. Out of these disputes, however, has grown an immense amount of research and an accumulation of knowledge relating to the use of creosote as a preservative. While it would be tedious even to list the many items that have been under study, out of them there is growing a better understanding of the preservative action of creosote of the methods best adapted for its use in the treating process, and of what happens when the treated wood is exposed to the elements during service. As a result, there have been marked changes in the treating processes, which are also reflected in those in which preservative salts are used, as is witnessed by the specifications for various kinds of treatment that have been prepared by the American Wood-Preservers' Association and the American Railway Engineering Association.

Within recent years increased interest has been displayed in salts other than zinc chloride, induced in part by the increasing demand for a "clean" treatment, and several preservatives of this character have come into extensive use. These include chromated zinc chloride, Wolman salts and zinc meta arsenite, all of which have come into sufficiently widespread use to be given individual classifications in the last compilation of preservative statistics issued by the Forest Service, United States Department of Agriculture, in co-operation with the American Wood-Preservers' Association.

Decay Is Investigated

Since a knowledge of the causes and processes of decay is of prime importance in wood preservation, these matters early became subjects of intensive study, and while these matters are more fully understood today, the studies are still in progress. They have been stimulated in recent years by the American Wood-Preservers' Association, by the Committee on Wood Preservation of the American Railway Engineering Association, and by the establishment of the United States Forest Products Laboratory, although research along these lines is also

being carried on in many quarters by independent investigators. As a result of these studies, there has been marked progress in the technical developments relating to the production and handling of timber prior to treatment, through which stringent regulations have been devised for keeping the timber under aseptic conditions from the time the tree is cut, through the seasoning period and until it is placed in the retort. Furthermore, the benefits of this expanding knowledge have extended to the care of the treated wood in service, in ways that have added materially to its service life.

Up to a relatively short time ago, little thought was given to the preparation of timber for treatment, except so far as it related to seasoning and the prevention of decay prior to treatment. But crossties, bridge timbers, poles, etc., too frequently failed from decay despite the closest control of the treating operations and heavy injections of preservatives. Studies indicated that much of this trouble arose from the fact that timbers were framed and bored and that ties were adzed and spiked after treatment, thus destroying the protective zone of treated wood, and exposing the untreated interior to attack by decay-producing organisms.

With the advent of large tie plates, the machine adzing of crossties to produce a better and more uniform bearing for the rail became a prime necessity, and equipment was designed to do the adzing before the ties were taken to the retorts. Machines were also designed to prebore the ties to insure a zone of treated wood around the spikes. While preadzing and preboring have not yet become universal, these practices are gaining favor.

Although the value of preframing structural timber was admitted, many difficulties, some actual and some imaginary, were foreseen in its accomplishment. In the first place, no machines existed for the framing of large timbers, and while a few progressive roads undertook to preframe their bridge timbers by hand, they found it to be a slow and expensive operation. Here again, machines were developed for this purpose. While the preframing of timbers has by no means become universal as yet, not a few roads are now preframing all material that is to be treated for use in both bridges and buildings, and find it both practical and economical.

Thus step by step, the art of wood preservation has been developed—through the perfection of processes for the introduction of the preservative into the timber, through the testing and refinement of preservatives to determine those most effective for different conditions, through the selection and care of the timber both before and after treatment to insure that the preservative will be given the most favorable opportunity, until treated timber today is accepted as a dependable constructional material with characteristics approaching those of permanency.

What Wood Preservation Owes to the Railways

Since wood preservation was first introduced into this country, the railways have been the backbone of the industry. It was a railway that used the first timber treated in the United States. It was the unorganized efforts of individual railways that kept interest in the subject alive at a time when timber was so cheap that there was no general demand for the preservative treatment of wood. It was a railway that built the first creosoting plant in the United States. It was a railway that built the plant which marks the beginning of preservative treatment in an organized way. It was the railways as a whole that sustained the infant industry when it was struggling in the face of seemingly insurmountable difficulties to gain a foothold and which, without the encouragement and aid they gave, would have suffered ignominious defeat. From the beginning the railways have consumed an overwhelming proportion of the products of wood preservation, and even today, with the greatest diversification in the use of treated wood since the industry came into being, they still use more than two-thirds of all the wood that is being given preservative treatment. Furthermore, the railways still offer the largest concentrated market for the further use of treated timber in many diversified forms.

If the railways had not persisted in their belief in the economic value of preservative treatment, despite the many failures of treated timber to live up to expectations, it is doubtful whether wood preservation could have reached the position it now occupies in our national economy. Likewise, if the railways were now to discontinue the use of treated timber, the wood preserving industry would receive a blow from which it could recover only with the greatest difficulty.

In view of the important position which the railways occupy with relation to the wood preserving industry, it will be instructive to review the part they have played in its development and to ascertain the reasons why they maintained their interest in treated wood in the face of its many failures to meet expectations with respect to service benefits and longer life. This interest was aroused initially by an apparent approaching shortage in the timber supply as lumbering operations depleted the forests and settlers moved in along the new railways that were being constructed, thus creating a continually increasing demand for timber in the face of a diminishing supply.

First Ties Treated

Envisioning the time when it would be difficult to obtain ties at a reasonable price, a number of roads early began studies to determine ways in which their service life could be extended. In 1838, the Northern Central, now part of the Pennsylvania, steeped enough chestnut ties in corrosive sublimate (Kyan process) to tie one mile of track. These were laid together and compared with untreated chestnut. In a report dated in 1849 it was stated that after 11 years the treated ties were still sound, showing few signs of decay, although the untreated ties had lasted only 7 years. This was the first attempt in this country to use wood that had been given preservative treatment and, although the experiment was considered a success, the process was abandoned because of the reported detrimental effect of the mercury salt on the men employed in the treatment and handling of the timber, as well as because of the slowness of the process.

Similar experiments were conducted by the Louisa (Chesapeake & Ohio), on oak ties, in 1840, which were reported to be successful; and by the New York Central, on hemlock ties, in 1849, which after 10 years were reported to be in good condition, although untreated hemlock was good for only 3 to 5 years. Unfavorable results were obtained by the Baltimore & Ohio, in 1842; by the Old Colony, in 1845; by the Providence & Wooster, in 1847; and by the Boston & Providence, in 1856; partly because of faulty treatment. In 1846, the Eastern Massachusetts, using the pressure process, Kyanized a

lot of spruce and oak longitudinal timbers for supporting the rail, and continued to do so for several years. This road abandoned the process later, partly because of the cost and partly because it had been decided to use ties instead of longitudinal timbers under the rails. While reports of the results were not consistent, it was claimed that some of the spruce timbers lasted as long as 20 years.

Bridge Timbers Treated

Experiments with Kyanizing were not confined to ties, however, for the Philadelphia & Reading, in 1850; the Fitchburg, in 1853; and the New York & New England, in 1854; treated timbers by this method for the construction of truss spans, all of which were reported to be successful. These bridges remained in service for periods ranging from 20 to 28 years, until they were dismantled to make way for heavier structures, at which time the timbers were still sound. The testimony is unanimous that the life obtained from the treated timbers was greater than could have been expected from untreated material, and it was not overlooked that, so far as decay was concerned, the timbers could have remained in service for an undetermined number of years.

The record of these experiments, which are so termed because in only a few instances were they developed into settled practices, has been given to show the early and widespread interest of the railways in the preservative treatment of wood. This interest is emphasized when it is considered that of the 16 experiments that have been dependably recorded, 13 were carried on by railways, 2 by the federal government, and 1 by the Lowell Canal Company, and that even in these experiments the amount of treated wood used by the government and the canal company was negligible when compared with that by the railways.

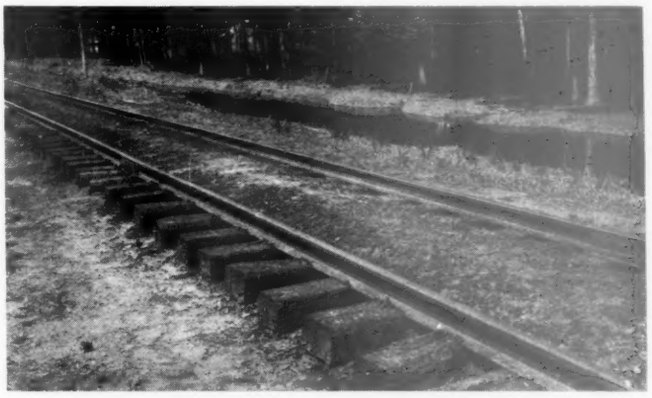
Since Kyanizing was an open-tank process, it had two serious drawbacks in addition to the corrosive and poisonous character of the preservative for little penetration was obtained, so that the untreated wood was easily exposed, and the process required so much time that a plant of reasonable size was unable to produce the amount of treated material required in railway maintenance. For these and other reasons, attention was turned about 1850 to treatment with zinc chloride by the Burnett process. As this was a pressure treatment, the results were much better and the process was received with more favor, completely displacing Kyanizing within a few years. The use of this preservative was initiated by the railways and they were foremost in the development of the process in this country.

Railways Turn to Zinc Chloride

During the early period while the use of the Burnett process was being developed in this country, a number of railways erected their own plants, but owing to the sizeable investment involved and the inconvenience and annoyances attending their operation, most of them preferred to rely on commercial plants, the greater part of the output from which went to the railways. In fact, it has been estimated that during this period of development, say to 1880, about 95 per cent of the total amount of wood treated was consumed by the railways, the remainder going generally into wharf construction and pavements. During this period also, while ties constituted the bulk of the timber treated, there was considerable expansion in the use of treated timber in railway bridge construction.

Many examples of early and complete failure are recorded for both ties and construction timbers. Where these failures were traced to their source it was found that they fell into two classes with respect to the cause. One of the most common complaints was that where the timber was exposed to moisture the preservative salt leached out; yet the testimony is general that even where this happened, the life of the treated timber was longer than that of untreated timber exposed to the same conditions, provided the treatment had been applied properly.

The second class included poor work, some of the



A Section of the Cleveland, Tex., Test Track Established by the Santa Fe in 1902—One of the Outstanding Proving Grounds for Preservatives and Treatments

causes of which were treatment without preliminary steaming; holding ties in the field so long that decay was present before treatment; efforts to treat green timber that was frozen; taking the timber directly from the stump to the retort; hurrying it through the retort, with the result that it was inadequately treated; and failure to apply sufficient pressure to obtain satisfactory penetration. In fact, in a discussion of the period, it was stated that so great was the impatience of railway officers to get timber through the plants that "pressure was applied to the operatives, instead of to the cylinders," with disastrous results to the treated product. Another cause of failure that, while less common, was of sufficient importance to merit mention, was the use of too strong a solution of the zinc chloride, with the idea that if some of the salt did leach out, enough would remain to prevent decay. This apparently destroyed the strength of the wood, causing it to become "as brittle as a carrot," so that ties subjected to treatment with saturated solutions of the salt frequently broke in unloading.

Despite the many unfortunate experiences, enough examples of increased life and satisfactory performance of treated timber were recorded to convince railway officers that preservative treatment could be made an economic success by further perfecting the technique of the process and by insisting on better work. This opinion was confirmed by the development of several processes, such as those of Wellhouse, Allardyce and Card, which were designed to increase the efficiency of the treatment and to reduce leaching. It was the examples of successful treatment, the active efforts to improve technique and processes, and the continuing rise in the price of timber that induced the railways to adhere to their faith in wood preservation in the face of almost limitless discouragements.

Railway Builds First Creosoting Plant

It was soon discovered that piles treated with zinc chloride were not immune to teredo attack. For this

reason, in 1865, the Dighton & Somerset (Old Colony, now the New York, New Haven & Hartford), erected a creosoting plant at Somerset, Mass., in which 700 piles were treated for the construction of a bridge across the Taunton river, where teredo infestation was relatively severe. Although the treating was done hurriedly and some carelessness was permitted during construction, in that knots were trimmed off and some adzing was done to obtain a better fit for the bracing, with the result that the piles thus misused were attacked and about 200 were replaced during the next few years because of teredo damage, the job was considered a success and attracted wide attention.

A number of commercial creosoting plants were constructed during the next decade and considerable creosoting material was placed in service by the railways in structures in tide water. Much of the experience with this product was unfavorable and for this reason as well as because of the high cost of creosote, this process made little headway. Creosoting received a decided impetus, however, when the Louisville & Nashville constructed its plant at West Pascagoula, Miss., in 1875, to treat piles and bridge timbers for use in the teredo-infested waters along the Gulf of Mexico. Treatment at this plant was done so thoroughly and the results were so satisfactory that the railways became convinced of the efficacy of the process when it was carried out carefully.

Creosote treatment, however, suffered its share of failures which, in general, could be traced to the same causes as those of zinc chloride, that is, poor work. Prior to the construction of the West Pascagoula plant, consideration had been given to the practicability of contracting for the treatment of the material that was needed, for a number of commercial plants were then engaged in treating timber with creosote. Examination of these plants and their products was undertaken and a report of this investigation states that "examination of their products and of the oldest creosote work that could be found was convincing that if creosoting could be done properly, it would be good and effective; but it it could not be done better than anyone was then doing it, it had better be left alone." On the other hand, "wherever a piece of timber could be found that had been saturated with oil, it was perfectly sound, and these isolated specimens were evidence * * * that creosote was a specific against decay and the ravages of marine animals, if properly used."

While the belief grew that creosote properly applied would give the best protection against decay of any known preservative, the conditions that were mentioned in the reports made the railways chary of using it extensively, although they did adopt it to some extent. In fact, in 1880, the Houston & Texas Central erected a plant at Houston, Tex., with two cylinders for the treatment of ties, bridge timbers and tank frames; and the New Orleans & North Eastern built one at Slidell, La., primarily to treat material for the Pontchartrain trestle. Another consideration which retarded the adoption of creosote as a preservative was its high cost compared with other preservatives, particularly zinc chloride. Ties were cheap, and prices for other timber had not yet reached the level where it was considered economical to pay for the higher-priced treatment, particularly as at this time a large proportion of the treated ties were failing from mechanical destruction rather than decay.

Railways Expand Use of Treated Material

For these reasons the railways turned largely to zinc chloride and during the three decades subsequent to 1880 there was marked expansion of its use. It was during this period that efforts were made to combine creosote and zinc chloride for the dual purpose of reducing the cost of treatment with the former and to obtain full benefit of the antiseptic qualities of the salt by the elimination of leaching. It should not be lost sight of that while some treated wood was being used outside of the railway field, substantially all of the activity of this period connected with developments in treating processes and the construction of wood preserving plants, was carried on either by the railways themselves or in their behalf. In fact, a great deal of the effort was directed to improvements in the service characteristics of ties. During most of this period ties alone represented about 90 per cent of all material treated, although up to 1904 less than 10 per cent of all ties used were given preservative treatment.

While the product of the treating plants was gradually improving, the results were as yet far from satisfactory. Many of the factors that were causing failures were not yet fully understood and there arose a belief on the part of not a few railway officers that they did not have sufficient control of the treating operations in commercial plants, and that they could overcome their troubles only by building and operating their own plants.

Another factor that had a definite influence on the trend toward the construction of treating plants by the railways was that of continuity of supply. When a railway once adopted the practice of using treated wood, its demands in terms of volume were likely to be large until such time as all untreated timbers were replaced. Deliveries of orders placed with commercial plants were often delayed to permit completion of prior orders, much to the exasperation of the officers who needed the material. While this situation was often the fault of the railways themselves, it did not lessen the impatience of the officers who were waiting for the material.

The combination of these and other factors, including

examples of poor work; failures, the causes for which remained undetermined; disputes with operators of commercial plants with respect to the technic of the processes; desire to have full control of all operations, including the period of seasoning; the belief on the part of a few that they were better qualified to run the plants than the owners; a growing belief that the managements of commercial plants were not fully alert to developing better technic in their operations; a widespread suspicion that treatment was being slighted in the interest of production; and inability to get deliveries as desired; as well as the lack of commercial plants in certain sections, exerted a strong influence on the attitude of railway officers with respect to the operation of treating plants. There was also a desire in some quarters to eliminate the item of profit which a commercial plant must of necessity include in the price of its product. Again, the success of the treating plants that were being operated by the railways at Pascagoula, Slidell, Houston, and Las Vegas, N. M., provided an added impetus to the movement toward railway-owned and operated treating plants, and especially toward the use of creosote as a preservative.

Indicating the magnitude of this trend, by 1903 there were 27 pressure-treating plants in the United States, of which 13 were owned and operated by the railways, while a number of the remainder were operated by commercial companies either wholly or primarily for the railways upon which they were located. The impetus of this movement continued for two more decades, during which period the number of railway-owned and operated plants more than doubled, while as many or more plants were constructed by commercial treating companies under contracts that required them to treat timber solely for the railways upon which they were located.

It should not be assumed that these 27 plants which were in active operation in 1903 represented the total number that had been constructed up to and including this date, for a far greater number had passed out of existence. In fact, one of the plants in operation at that time was the third that its owner had built, the other two having been replaced because of obsolescence. These were only the plants that had survived the ravages of time, the continued developments in processes and equipment and the need for greater capacity.

Railways Reverse Policy

Plants owned and operated by the railways continued to increase in number until 1922, when 32 were in active service. Since that year, however, this number has gradually declined, until in 1937 there were only 23 railway-operated treating plants. In addition, some of the commercial plants were released from their obligation to treat solely for the railways upon which they were located. It becomes of interest, therefore, to examine the reasons for this reversal of policy. It is obvious that it did not result from a cessation of the use of treated wood, for the railways are today more firmly committed to the use of treated wood than ever before, and are still consuming more than two-thirds of the wood that is being given preservative treatment. It will be necessary to seek further for the cause.

In the intervening years there have been marked changes in the wood preserving industry. It has been put on a sounder and more dependable basis, in that it has largely purged itself of unethical practices. The companies now engaged in commercial treatment are striving, as many of them did previously, conscientiously to improve their product. Many of them are constantly engaged in research with this objective in view, and all are alert to take advantage of new technical developments which will accomplish this. Again, in recent years, some phases of the technic of the preparation and treatment of the wood, and of the preservatives, have become so complex and highly technical that they can be kept under study only by specialists. For this reason, in recent years, the railways have been content to leave these matters to an increasing degree to those engaged in the field of commercial treatment.

Moreover, in the majority of cases, railway treating plants were built with sufficient capacity to meet the needs of a period when treated wood was being used to replace untreated material. As the amount of untreated material in service declined, the demands on the plants decreased correspondingly, until today, on some roads this demand is confined largely to the replacement of the longer-lived treated material. For this reason, these roads have been confronted with surplus capacity. There has, therefore, been a definite trend toward turning these plants over to commercial-treating companies, which are able to sell this surplus capacity. Both the railway and the commercial treater gain by this arrangement, the latter because he is assured of a stable market up to the limit of the needs of the railway; and the railway in that it is relieved of an inefficient operation and is benefited by the additional freight that is brought to it through the use of the surplus capacity.

This trend from railway to commercial ownership of plants does not indicate any lessening of interest in treated wood on the part of the railways. On the contrary, there has never been a time when they have used it for a greater diversity of purposes. Originally, and even up to a few years ago, ties constituted from 90 to 95 per cent of this use, the remainder being piles and timbers for bridges and marine structures. Today, the railways uses include ties and tie plugs; piles and struc-

A Modern Wood Preservation Plant Requires Ample Facilities for the Seasoning As Well As the Treatment of Timber

tural timbers for bridges, dock, piers, overhead highway structures, bulkheads; buildings, platforms, etc.; tanks and tank frames; fence posts, crossing plank, trunking and capping, conduits and culverts; car material; cradles; scows; wood blocks for shop and freight station floors; and material for a variety of other purposes. Furthermore, they are constantly finding new uses for treated material, as for example, the recent installation by the Missouri Pacific of sub-ballast grillages of treated timber to overcome soft spots in the track.

Part Railway Men Have Played

No discussion of the part that the railways have played in the development of the wood preserving industry would be complete without mention of some of the railway men who have taken part in this development and who, by their pioneering efforts not only raised the standards of their own day, but pointed the way to still higher standards, and who have thus been instrumental in bringing the industry to the place it now occupies. Passing over men of the earlier period who collectively kept the spark of interest in wood preservation alive, but who did not contribute individually in any large measure to the development of higher standards, we come to those who initiated the modern era of timber preservation and played important roles in its development.

The first of these was J. W. Putnam who built the L. & N. creosoting plant at West Pascagoula, Miss.; who did such a splendid job of treating the piles and timbers for which the plant was built, that he demonstrated for all time the value of creosote as a preservative; and who, still later, was in charge of creosoting the piles and timbers for the bridge over Lake Pontchartrain. Putnam stood practically alone in the short period which he represented, but which sharply defines the transition from four decades of experimental work to the era in which wood preservation began to be established on a sound basis and the growth of the industry as it is today had its beginning.

Among the railway men of the period shortly following that of Putnam who made outstanding contributions to the art of wood preservation was John D. Isaacs, consulting engineer of the Southern Pacific, who in 1892, jointly with W. F. Curtis developed a portable treating plant and in other ways did much to develop means for the treatment of Douglas fir and other refractory woods of the West Coast. In the period from 1897 to 1918, E. O. Faulkner, tie and timber agent of the Atchison, Topeka & Santa Fe, saw in wood preservation a means for overcoming the heavy drains that were being made on the forests of the country to meet railway requirements for ties and other timbers. Among his many activities, he did much to stimulate the development of preservatives and practices adapted to the climatic conditions of the Southwest, being instrumental in the development of test sections for determining the merits of various preservatives and methods of treatment; their value when applied to different species of wood; and the performance of treated timber under a variety of climatic conditions. The most outstanding of these test sections is the one established at Cleveland, Tex., in 1902, where a wide variety of wood treated by various processes and preservatives is still being kept under constant observation. Working along similar lines, F. J. Angier did much to promote knowledge of tie service, largely in the Middle West and the Northwest, by establishing test sections of ties on each operating division of the Burlington in 1909 and 1910.

Another pioneer who did much during the formative period of modern wood preservation to raise the standards of timber treatment, by insisting that only sound wood should be treated, was George Rex, manager of treating plants on the Santa Fe from 1909 to 1920. With others, he early recognized the necessity for getting ties and other timbers out of the woods as quickly as possible after the trees were cut, to remove them from the decay-producing conditions which prevail in the forest, and the importance of providing for storage during the seasoning period on yards carefully laid out, drained and kept free of vegetation to minimize the chances for infection. He also initiated the use of cut-off saws to facilitate the examination of the interior of timbers and avoid the treatment of timber in which decay was already advanced.

Coming to the present generation, John Foley, forester, Pennsylvania, will long be remembered for his constructive work in the field of timber production during the days of federal control of the railways and since, in creating an appreciation of the importance of proper manufacture and seasoning and adequate size of timber, especially crossties, preliminary to its treatment. Many other railway men of the present generation are as alert as those of former periods with respect to improvements in wood preservation, and are continuing a relentless campaign for better preservative materials and practices.

The railways are today, as they have always been, the proving ground for old processes and preservatives as well as for new developments in both. Through literally hundreds of test sections, such as those that have been mentioned, they are determining the merit of new preservatives and demonstrating the necessity for modifications in the use of old preservatives and processes. With the sustained interest of the railways, their persistent faith in the value of preservative treatment and their continued support through the use of large quantities of treated wood, it is to be expected that the treatment of timber for railway use will expand until it becomes all but universal.

What Wood Preservation Has Done for the Railways

Is it worth while to save $150,000,000 a year? This may be a startling question. Yet this is a conservative estimate of the amount that the railways are now saving through the use of treated timber. Still more startling, it is much less than they will be able to save eventually when they extend the use of treated timber to those additional applications where its use may also be justified. In making these statements it is realized that they are not susceptible of direct proof, for it is impossible to determine what the price of timber would be today if wood preservation had not stepped in and, by reducing the drain on the forests, kept prices at a reasonable level. In this article an effort will be made to evaluate some of the savings that have been and some of the further savings that can still be made through the use of treated timber, and to show that wood preservation has an economic value for the railways far greater than is generally realized.

When wood preservation first attracted the attention of the railways, timber was plentiful and cheap and the preservative treatment of wood made no appeal to railway officers as a measure of economy. They looked

upon it primarily as a conservation measure whereby they could assure themselves of an ample supply of timber to meet their future needs. So deeply was this viewpoint impressed upon railway officers during the early period of wood preservation that it is still an important influence in their attitude towards timber treatment.

Realization that wood preservation had an economic value far beyond that of conservation of natural resources alone, came slowly. Railway officers were constantly expecting complete exhaustion of the forests and higher prices for timber. However, as new lines were built into virgin territory, new forest resources were tapped and prices for timber remained nearly constant or rose so slowly that there was little incentive to study the economics of wood preservation.

Eventually the cost of timber rose until by 1880 it was beginning to give concern. At the same time, as the mileage of new lines continued to increase and add to the drain on the forests, it became evident that the more enduring woods were becoming scarce and that to keep maintenance costs within reasonable bounds, it would be necessary to turn to inferior woods, particularly for ties. It was also recognized that these woods were not enduring and that if used without treatment their service life would be so short that this change would be little less than a calamity.

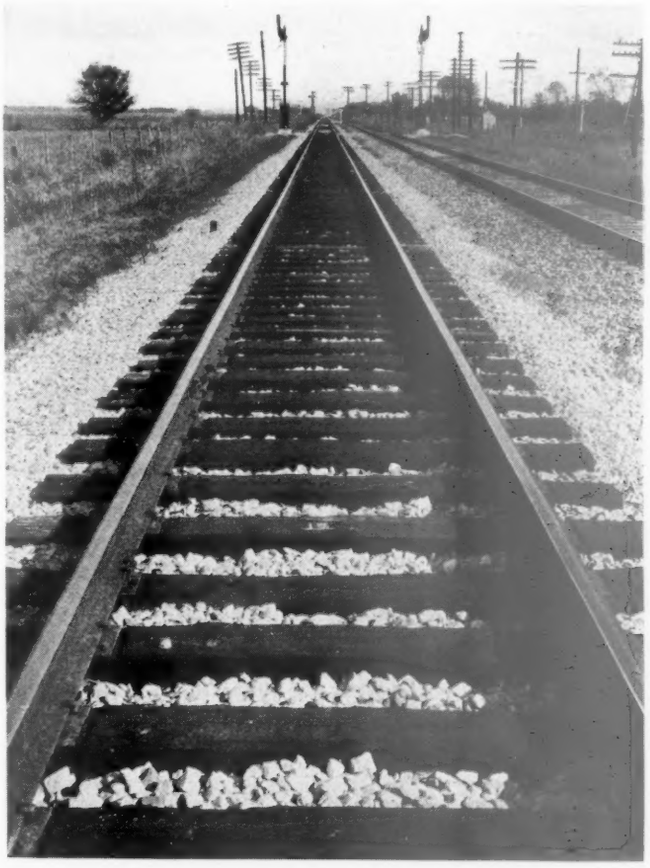
At about the same time bridges began to give equal concern, for with rising prices and increasing difficulty in obtaining the large dimension timbers of the species then in common use, the cost of bridge maintenance was increasing rapidly. Piles treated with zinc chloride and subjected to moisture gave little better service than untreated piles. Partly for this reason and partly because of the impressive performance of the material that had been treated at Pascagoula, Houston and Slidell, creosote was adopted universally as the preservative for bridge timber. Prior to the general adoption of treated timber in bridge construction, all trestles had been of the open-deck type, but with the knowledge that with preservative treatment, repairs and renewals of these structures would be less frequent, the ballast deck came into use and this has added further to the economy of bridge maintenance.

Wood Preservation Holds Prices Down

These then were the conditions which confronted the railways in 1880, namely, approaching exhaustion of the more desirable species of wood, rapidly rising prices for timber and the resulting necessity for turning to inferior and less durable woods. These conditions pointed very definitely toward the need for a wider use of treated timber than most railway officers had thought would ever be necessary. It will be of interest, therefore, to study the record and determine whether the preservative treatment of wood has been of benefit to them.

While the price of timber has increased measurably during the 60 years since 1880, when prices were rising so rapidly, it is indisputable that the rate of this increase has been greatly reduced, compared with the rate immediately prior to 1880. During this 60-year interval the supply of the so-called inferior woods has been ample to meet all demands, and by relieving the pressure on the more desirable woods, has tended to keep prices down all along the line. Moreover, when the demand for certain species of the inferior woods has reached the point where prices began to rise, the railways have turned to others, and in this way also prices have been kept at a reasonable level. This in itself is an economic benefit of no small importance, not only to the railways but to all users of wood.

During this 60-year interval the fear of complete exhaustion of the forests has never fully subsided, and there have been recurring periods when this fear has been greatly intensified. During one of these periods, before the use of treated timber became as widespread as it now is, E. O. Faulkner, tie and timber agent of the Atchison, Topeka & Santa Fe, went to points as remote as Japan and the Philippine Islands to develop new sources of supply, and he imported more than a million ties from the Philippines. That this was not an isolated



One of the Many Hundreds of Test Tracks Through Which the Railways Are Studying Processes, Treatments and Tie Life

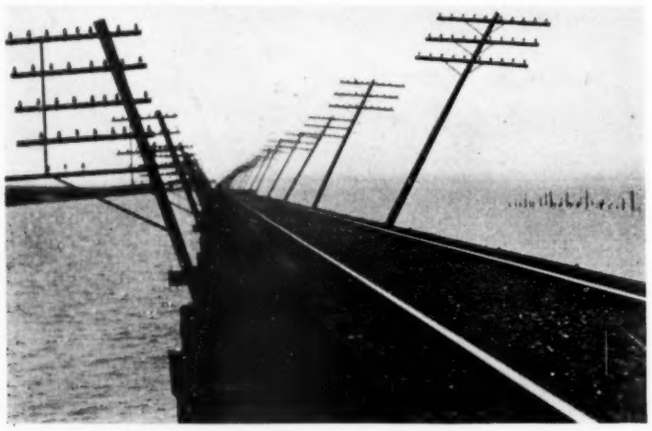
case of concern about the domestic supply is indicated by the investigations made by several eastern roads of the possibility of securing ties in Central and South America to make good the expected shortage of domestic ties. It is significant that none of these roads imported ties, except a few for experimental purposes, for wood preservation came to the rescue, since through the more widespread adoption of preservative treatment, sufficient additional life has been obtained from domestic woods to make importation unnecessary. This, too, is an economic benefit, the value of which can scarcely be estimated.

What the Savings Are

No one can fix a definite figure on the value of the benefits which the railways have realized from this stabilization of prices and the elimination of the necessity for imports for no one can say what the cost of timber would have been today without the equalizing influence of wood preservation. On the other hand, there are

direct savings that can be evaluated. As an indication of the magnitude of these savings, there are approximately 1,250,000,000 ties in the maintained tracks of the railways of the United States and Canada. Experience has shown that the average life of the untreated inferior woods available for tie purposes today is 5.6 years, but that this life is being increased to 20 or more years by preservative treatment, while some roads are getting nearer 30 years' service life from their treated ties.

If, therefore, all ties were untreated, the annual renewals would approximate 225,000,000 ties. Likewise,



After 55 years, More Than Half of the Original Creosoted Timber Still Remains in the 5.82-Mile Trestle of the Southern Across Lake Pontchartrain, in Louisiana

on the basis of a service life of 20 years if all ties were treated, the annual renewals would approximate 62,500,000 ties. Again, if the cost of an untreated tie in the track is $1.40 and that of a treated tie is $2, when all ties in service are treated ties the annual saving will approximate $180,000,000, compared with the universal use of untreated ties. On this same basis, taking the 27 roads reporting to the Committee on Wood Preservation of the American Railway Engineering Association and to the Committee on Tie Service Records of the American Wood-Preservers' Association, and comparing the average renewals per mile of maintained track for the five-year period ending with 1911, with the five-year period ending with 1936, it will be found that individual roads in this group are saving from two to four million dollars annually through the use of treated ties.

In papers presented at recent conventions of the American Wood-Preservers' Association, H. R. Clarke, engineer maintenance of way, Chicago, Burlington & Quincy, and R. H. Ford, chief engineer, Chicago, Rock Island & Pacific, estimated the savings on their respective roads through the use of treated ties at $2,880,000 and $2,341,000 annually. These specific examples might be extended to include a much larger number of individual roads, but those that have been given are sufficient to show that the savings realized from the use of treated ties are real and substantial.

How Wood Preservation Affects Trestles

Turning to bridges, A. F. Robinson, then bridge engineer of the Atchison, Topeka & Santa Fe, stated in a paper presented at a joint meeting of the American Wood-Preservers' Association and the Western Society of Engineers at Chicago in 1922, that "even when we had good white oak piles, we had to spend from 5 to 50 cents per month per foot of bridge for maintenance after a few years, while our creosoted ballast-deck bridges have stood for years and years and after that have not cost $10 per 100 ft. of bridge per year." Likewise, at a similar joint meeting in 1933, Earl Stimson, then chief engineer maintenance of the Baltimore & Ohio, referred to a creosoted, ballast-deck, pile trestle which was constructed in 1910, and which up to 1933 had required no expenditure whatever for maintenance. He also stated that a recent inspection had indicated that no replacement of any of its members would be required for an indeterminate number of years additional.

In 1894, D. K. Colburn, then bridge engineer of the Southern Pacific Lines east of El Paso, stated that "the first creosoted work that I put in this section about 20 years ago is still in . . . I suppose that about 35 per cent of our bridges are creosoted, and the economy of this practice is being demonstrated today by the decreasing amount of timber we use each year." Again, 41 years later, in 1935, George W. Rear, bridge engineer of the Southern Pacific, Pacific Lines, said in a paper which he presented before the American Wood-Preservers' Association, that "records indicated that by 1895 the Southern Pacific had more than 50,000 lin. ft. of ballast-deck creosoted trestles. Many of these structures are still in service and in condition to last for many more years." Similar testimony as to the economic value of wood preservation in timber bridge construction has been given by other bridge and maintenance engineers. These statements afford ample evidence of the character and magnitude of the benefits the railways have obtained through the use of treated material in bridges.

The Illinois Central Used Treated Timber Throughout in the Construction of Its Double-Track Trestle Built Over the Bonnet Carré Spillway, Near New Orleans, La., in 1933. This Structure Is More Than 11,000 Ft. Long and Required Approximately 10,000 Piles

These results were not obtained without attendant

difficulties, for many of the early structures built of treated material failed from decay about as quickly as those in which untreated material had been used. Holes were being bored and timbers were framed to fit in the field, exposing the untreated material beneath the zone penetrated by the preservative, thus completely nullifying all of the benefits of the preservative treatment. To eliminate this form of damage, numerous other roads, including the Baltimore & Ohio, the Erie, the Union Pacific and the Chesapeake & Ohio, are preframing the timber for trestles. On the latter road all material to be treated for building purposes is included. Plans for preframing the structures are prepared as carefully as for steel structures, and no difficulties have been experienced in assembling the preframed material in the field.

There are at present approximately 2,500 track miles, or more than 13,000,000 lin. ft., of timber trestles in service on the railways. Even with the best material available, the life of an untreated trestle ranges from 4 to 20 years, depending on its location, with the average for the country as a whole about 8 years. In contrast, the life of creosoted trestles may be conservatively estimated at 25 years, while the cost of maintenance is correspondingly reduced. On the basis of these figures, the savings that can be effected through the universal use of treated timber for trestles, including both replacement and maintenance costs, exceeds $20,000,000 a year.

Creosote Stops Teredo Damage

A phase of wood preservation that does not have as wide application as those that have been mentioned, but from which benefits of almost indeterminate magnitude are realized by the railways, by reason of their large ownership of wharves and piers at ports, is the treatment of timber for use in coastal waters. Evidence that in this application wood preservation has an economic value of great magnitude is found in Mr. Rear's paper already mentioned in which he said that "with the advent of creosoted piling, our trouble with marine borers became of small moment." Citing the Oakland Long wharf in San Francisco bay, in which 14,000 piles were driven in 1890 and removed in 1919, he said that, "after 29 years of service most of these piles were suitable for redriving in salt water, although the marine-borer infestation is so severe that untreated piles are destroyed in about two years." The life of creosoted piles in the waters of the Gulf of Mexico is not always so favorable as on the Pacific Coast, but even in the heavily infested waters of the Gulf, many excellent records have been established, and the life of well-creosoted piles is from 10 to 20 times that of untreated piles.

Wood Preservation Prevents Termite Damage

Another form of protection against the destruction of wood, in which the preservative treatment of timber has demonstrated a high economic value is that against termites and wood-boring insects. These insects find a supply of food in wooden buildings, including such railway structures as depots, warehouses, locomotive roundhouses, etc. While many means have been tried to prevent their damage, nothing has yet been found to be as effective as preservative treatment of the timber that goes into these structures, including posts, poles, piles, structural timbers and lumber. While no data exists from which a definite evaluation of this application of preservative treatment on the railways can be made, it is evident that it is high.

In still another field, the railways maintain more than 4,250,000 poles in signal, telephone, power-distribution and telegraph lines. On the assumption that the average life of untreated poles is 10 years and of treated poles is 25 years, the railways are saving more than $10,000,000 a year through the use of treated poles, including material, labor costs and replacement of poles and crossarms.

The foregoing figures do not by any means complete the picture of the economies that the railways are realizing from wood preservation, for they are using treated wood for a wide variety of other purposes, including culverts, fence posts, crossing plank, flooring, water tanks, etc. On the other hand, they have not yet taken full advantage of the benefits that can be realized if the use of treated wood is made universal, particularly in buildings and freight cars. The savings that are being and that can be realized are emphasized when it is understood that even with all of the economies that have been effected by preservative treatment the railways normally still spend $170,000,000 annually for forest products and use almost 20 per cent of the annual cut.

What Wood Preservation Can Still Do

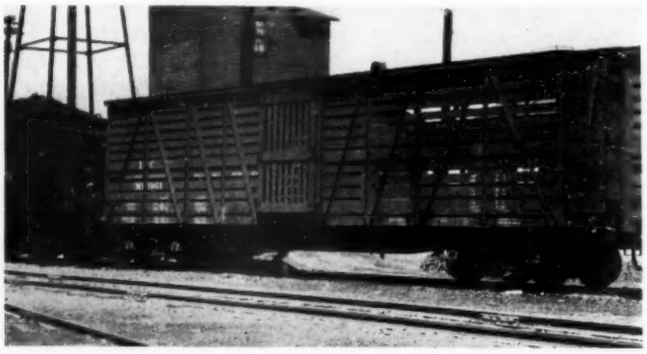
This year marks the completion of a century of the use of treated timber by the railways. For 100 years they have led in the development of wood preservation. For 100 years they have consistently used an overwhelming percentage of the timber that has been given preservative treatment. Today, despite a wider use of treated timber by other industries than ever before, they still use more than two-thirds of all of the timber that is treated in this country. During this long period of consistent use, they have gained an intimate knowledge of the economies that can be effected through the use of treated timber by reason of its longer life and the reduction in maintenance expense which ensue. With this background and knowledge of the benefits that can be derived from wood preservation, it might naturally be assumed that they are using it universally. Yet this use is far from universal.

Even if preservative treatment is not applied to all timber for the numberless purposes for which the railways use wood, one might expect ties to be an exception, for ties have always constituted the bulk of the timber that has been given preservative treatment, and treated ties have been used longer than any other form of treated material. Yet untreated ties are still being used to an extent that few realize, more than 9,600,000 being installed by class I railways in 1937. Among these roads 14 used untreated ties exclusively; 24 used untreated ties for more than half of their renewals during the year; 12 other roads inserted from 25 to 50 per cent of untreated ties; and others used smaller percentages of untreated ties. Thus, despite the fact that approximately 45,000,000 ties were given preservative treatment in 1937, it is evident that there is still opportunity for railways to effect attractive savings by the further use of treated ties.

This recalls the estimate made in 1927 by C. C. Cook, then maintenance engineer of the Baltimore & Ohio, that while the railways were then saving $53,000,000 a year through the use of treated ties, this saving could be doubled by treating all ties to give them a life of 20

years. It should not be overlooked in this connection that through improvements in treating processes, many roads are now obtaining considerably more than 20 years' service from their treated ties, compared with from 5 to 10 years from untreated ties, thus adding an appreciable amount to the potential savings stated by Mr. Cook.

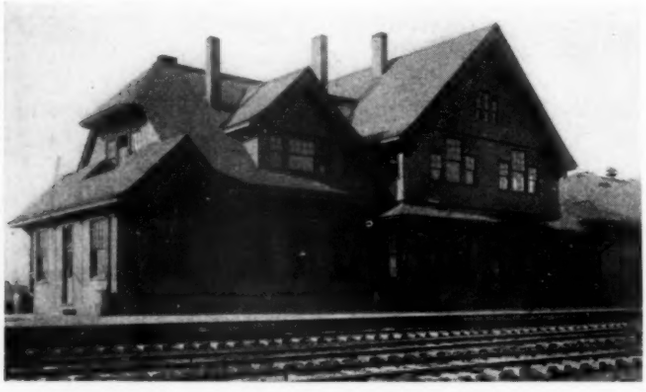
After ties, the next largest present use of treated material by the railways is in bridge construction and maintenance; yet in this application the use of treated material is as yet far from universal, despite its proved economies.



Freight Cars Offer An Almost Virgin Field in the Use of Treated Timber

Although some roads are using treated material exclusively for their timber trestles, others are still using large quantities of untreated materials for this purpose. Since the average life of an untreated trestle is about eight years, and the cost of maintenance is high during the latter part of its life, while there are records of many treated trestles that have given from 30 to 40, and even more, years of service life, with relatively small maintenance charges even in the later stages of their existence, the economic advantages of the preservative treatment of timber for bridges are obvious. For this reason, bridges offer a large opportunity for further economies through the more extensive application of preservative treatment.

In considering the benefits which the railways are not yet realizing through failure to fill all of their needs for



Many Advantages Can Be Demonstrated for the Use of Treated Timber in Railway Buildings

wood with treated timber, it should not be overlooked that the savings which result from the use of treated timber are not confined to the material alone, for if the life of the structure or tie can be extended from 6 to 8 years to 30 or 40, the savings in maintenance and the labor cost of several renewals may be as great as the saving in material.

Poles and Posts Provide Attractive Outlets

While the railways are now using many treated poles, they are not yet taking full advantage of the opportunity for economies that are inherent in this field, for only a part of the 3,500,000 poles they maintain are treated. The cost of treatment is so small a part of the cost of the pole in the line that this cost will be repaid by only a few years added life; yet the average service life can be extended from 10 to 25 years by preservative treatment.

Another field in which wood preservation can still do much for the railways is fencing. The railways maintain 500,000 miles of right-of-way and other forms of fencing, in which there are more than 160,000,000 fence posts. Although a large number of steel and concrete posts have been installed in recent years, wooden posts, largely untreated, still predominate. The requirements for renewals amount to 12,000,000 posts a year. The life of an untreated post of non-durable wood usually does not exceed 5 years, and in many localities it is as short as 3 to 3½ years; yet the life of such a post can be extended to 20 or 30 years through adequate preservative treatment. While the railways are using many treated posts, the percentage is small, and to a considerable extent this is, therefore, as yet a new field for the use of treated timber. The universal use of treated posts would reduce their requirements to some 8,000,000 posts annually.

An Opportunity in Grade Crossings

A use of treated wood which has as yet been given only minor consideration by the railways and is, therefore, practically a new use of this material, is in highway grade crossings. Despite the activity in grade-crossing elimination during the last few years, more than 230,000 highway crossings remain at grade. While many types of crossing materials have appeared on the market in recent years and some have been received with favor for the more important crossings, including concrete, steel, malleable iron and bituminous products, the wood plank crossing still predominates.

Crossing plank is subject to severe wear at a busy crossing, and the life of untreated material is usually determined by wear rather than decay. Largely for this reason, few railway maintenance officers have thought it worth while to use treated material. As a consequence, prior to 1935, more cubic feet of wood were treated for tie plugs than for crossing plank, the ratio in 1934 being about 15 to 1. In 1937, although the relative positions had been changed, the volume of crossing plank was still only about 1½ times that of tie plugs.

Experiments have shown, however, and experience has confirmed, that through careful selection of the species of wood and thorough treatment, much of this wear can be avoided and a satisfactory service life can be obtained from treated crossing plank. A number of roads prefer black gum for this use because its closely knit fibre resists wear better than most other woods and there is no tendency to fray and splinter. This wood is entirely unsuitable for use untreated, however, because it decays rapidly. Decay is eliminated by preservative treatment, which has been found also to increase resistance to wear and to reduce greatly the tendency to warp, a fruitful source of trouble with ordinary crossing plank. These facts indicate that wood-preservation can still do much for the railways in this appli-

cation and that it presents a real opportunity for expansion of the use of treated wood, especially as the present consumption of crossing plank is in excess of 50,000,000 ft. bm. annually.

Water Tanks

More than 26,000 tanks of 50,000 and 100,000 gal. capacity are required for the storage and softening of water to be delivered to locomotives. Wooden tanks still predominate in this service, although for many years the railways have been erecting steel tanks, largely because the supply of wood suitable for tank construction in its untreated state is so limited in quantity that prices are excessive, while the natural life of inferior woods is too short to make their use practicable. Faced with this situation, and having used creosoted tank frames since 1903, the Illinois Central began to use creosoted water tanks in 1916, usually of 100,000-gal. capacity, employing for this purpose some of the so-called inferior woods which could be obtained at a reasonable price. Today, this road has almost 200 such tanks in service, none of which have required the renewal of any of their parts. This is a field for the use of creosoted timber which has been given practically no consideration except on this one road, in which wood preservation can be made of considerable benefit to the railways if they will take advantage of the opportunity it affords.

For the more important grade separations on arterial highways where the highways are carried over the railways, particularly where long spans are required, wooden bridges are seldom suitable. Yet there are many such separations on less important highways where timber is as well adapted for the construction as other materials. Certain states permit a design for these situations, in which treated piles or framed bents support the stringers carrying the roadway, which may be finished with concrete or bituminous material. An extension of this or some similar type of construction would be of considerable benefit to the railways because of reduced costs, while it would provide substantially permanent structures requiring a minimum of maintenance.

Rarely Applied to Buildings

When one turns to railway buildings he finds almost a virgin field for preservative treatment for, despite long familiarity of building engineers with the merits of wood preservation and the economies it can effect, the use of treated material has made no appreciable headway in building construction, primarily because of objections to the odor of creosote and the possibility of staining from contact with it. Yet creosoted wood has been used extensively for parts below the first floor subfloor in residential, school, church and other buildings in such areas as Los Angeles, Cal. More particularly, "clean treatments" are available with salts that do not stain, and lumber so protected takes paint with the same facility as untreated wood. In many structures these salts are also used for treating the lumber that goes below the floor line.

One of the serious problems confronting building engineers is that of floors for piers and pier warehouses. These buildings alone contain approximately 50,000,000 sq. ft. of floor areas and approximately 8,000,000 sq. ft. are renewed annually. Untreated material decays rapidly under the moist conditions of the waterfront, and soon wears too rough for trucking. Black gum is one of the most resistant woods to wear, and installations treated with creosote and with salts have been highly successful from a trucking standpoint. As with crossing plank, the experience has beeen that when treated, the wood wears much more slowly than when untreated. Its use, therefore, affords an opportunity for the railways to obtain still further benefits from preservative treatment, which they have not previously realized.

Since the railways maintain and use more than 370,000 buildings, most of which are of frame construction while others employ wood in varying quantities, and since in normal times they spend more than $90,000,000 a year to maintain them, the opportunities to benefit

Grade Crossings, Which Require More Than 50,000,000 Ft. B. M. of Plank Annually, Offer a Large Field for the Effective Use of Treated Timber

from the installation of timber that has been given preservative treatment are obvious. It might be mentioned in passing that if the fullest advantage had been taken of preservative treatment for building lumber prior to the depression, the magnitude of the problem which now faces the railways with respect to building maintenance would be greatly lessened.

In frame structures, the parts below the first floor are more subject to decay and require more frequent renewal than other parts, except the roof. If, through preservative treatment, the life of these parts can be increased two or three times, an attractive saving in maintenance costs can be realized. Another benefit accruing from preservative treatment is the protection it affords from termite damage, by no means a negligible matter, as some roads are now aware.

Can Be Used in Cars

Freight car construction and maintenance is another field in which wood preservation has been practically ignored. A detailed record kept some time ago by a large railway of the reasons necessitating the removal of every part of all of the wooden cars passing through its most important repair yard for a specified period showed that of approximately 270,000 parts replaced, more than 82 per cent had failed by reason of decay and that less than 18 per cent were clearly mechanical failures, indicating that preservative treatment would have avoided the necessity for many of these repairs.

In this connection the experience of one of the large coal-mining companies with its mine cars is illuminating. These cars, ranging from 3 to 5 tons in capacity, are used for hauling coal and mine refuse from the working face to the surface. The refuse consists principally of slate and heavy rock, both broken irregularly with sharp edges. The cars have wood floors and sides, and abrasion is so severe that the average life of the untreated timber in the cars was about 3 years, with a maximum of 5 years. Decay is especially severe in the underground

(*Continued on page 324*)

Transferring Milk from Flat Car to Truck at Weehawken, N. J.

Rail-Highway Transport of Milk

New York, Ontario & Western and Motor Terminals, Inc., develop an unique co-ordinated system

AN EFFECTIVE system for the transportation of milk in containers that can readily be transferred between highway trucks and freight cars has been in operation on the New York, Ontario & Western for several months. The system was developed by Motor Terminals, Inc., in conjunction with the railway officers, and provides for the cheap and quick transfer of milk from highway to rail at the country stations and from rail to highway at the destination.

To describe a specific operation, milk is hauled from a creamery near Sherbourne Four Corners, N. Y., to the rail station of the N. Y. O. & W. A hand winch mechanism with skid rails is installed at the creamery to make it possible for one man to slide the container tanks into the building for cleaning and loading with raw milk. Motor Terminals have also developed crane devices suitable for installation in creameries or pasteurizing plants, which can elevate the containers to any desired floor level in such buildings, eliminating expensive pumping installations. From Sherbourne Four Corners, the containers are handled by rail to the joint milk terminal of the N. Y. O. & W. and the West Shore at Weehawken, N. J., 235 miles, and there transferred back to highway trucks for the 3½-mile haul to the pasteurizing plant at North Bergen, N. J.

Tank Equipment

The milk tanks, originally each of 200 cans (2,000 gal.) capacity, now of 250 cans (2,500 gal.) capacity, constitute four-purpose equipment. Each tank is suitable for the storage of milk within country creameries, for the transport of milk by rail to metropolitan districts, for shuttle truck transport from the rail head to the city pasteurizing plant where the tanks can be emptied directly into pasteurizing machines or be held with their contents hermetically sealed for short-term storage of milk. As a single unit, such tanks can cover the requirements of country creamery storage tanks, the tanks in rail cars, city shuttle tank trucks and city pasteurizing plant storage tanks.

The milk remains hermetically sealed from its point of origin to the city pasteurizer and for each batch shipment of the carload minimum (250 cans) and during its co-ordinated transportation, the milk is not exposed to bacteria in the air and not subjected to pumping agitation, as is customarily the case.

Rail Equipment

Any suitable underframe flat car or sheared down box car can be built up at small expense in railroad shops to handle milk in this manner. This requires stronger car side frames to support the concentrated load while the tank is moving from the car deck to the truck or trailer platform, skid rails on the car deck and positioner anchorage devices which rigidly hold the tanks on the car during the rail movement.

In addition, along the sides of the car at each tank location are hinges of special design for attachment to the roller bridges at the end of the truck electrical conveyor apparatus. The positioner anchorage members are collapsibly hinged and only two of the four anchorages need be lowered for the transfer. The cars in this service have each rendered more than 140,000 miles of rail haul and have required no more than the customary repairs.

The Conveyor Equipment

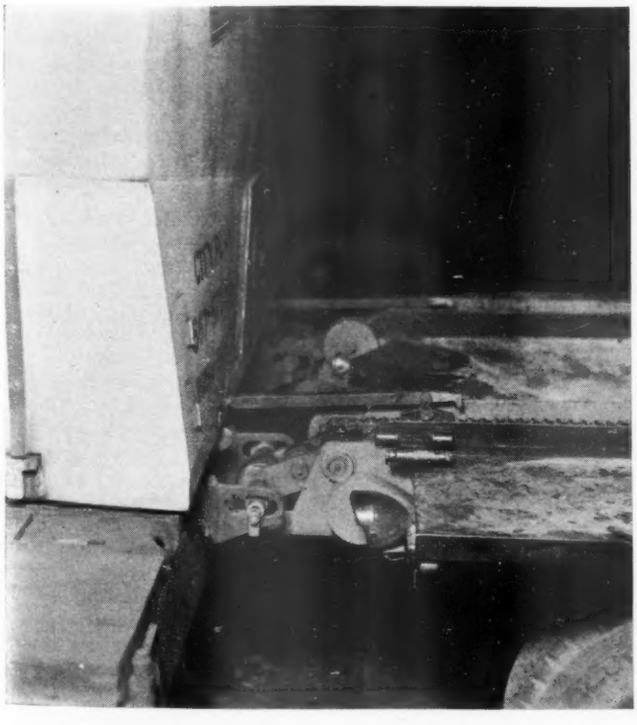
The conveyor equipment consists of a single structural steel platform which can be mounted on any exist-

Milk Container Mounted on Highway Truck

ing suitable straight frame truck or trailer. The skid rails of this structural steel frame are similar to the skid rails on the car, and adjacent to the skid rail is an endless conveyor chain driven by a three hp. electric motor through suitable gear reduction. A special generator can be suspended under either a truck or tractor frame and driven by the conventional automotive power take-off through a standard universal shaft.

To permit a one-man operation at the time of load interchanges and to reduce both the electrical equipment and its space requirements, a simple solenoid is mounted on the dash under the hood next to the engine. The end of this solenoid is connected with the carburetor butterfly valve. The solenoid is connected in the power line between the electrical generator and the motor.

After backing up to the car side, the driver engages the power take-off lever, leaving the cab with the motor running at idling speed. He then goes to the rear end of the truck, or at the car side, lowers the two positioner anchorages, connects the two articulated bridges with the car hinges, inserts two push-pull bars, and also inserts the push-button control cable, generally carried in the cab, into the receptacle provided in the truck side.



Close-Up of Attachment Between Flat Car and Highway Truck During Transfer of Container

At the end of the control cable is a small box housing two push buttons, one labeled "Forward" and the other "Reverse." The truck driver standing at the car side next presses the "Forward" button and immediately the resistance in the electrical circuit closes the solenoid, which in turn opens the butterfly valve of the carburetor to the adjusted pre-determined point for revolutions of the gasoline motor to rotate the generator at a sufficient speed to deliver the necessary voltage to the motor, driving the conveyor chains which in turn push or pull the tank on or off of the car.

The actual time of transfer of the tank from the car to the truck is 90 seconds. The driver, with his finger on the control button, walks alongside the truck, accompanying the tank in its movement from car to truck. If his finger is removed from the control, movement immediately terminates, the solenoid closing the butterfly valve of the engine carburetor to idling speed at which there is not sufficient generator out-put to require resistance grids. The driver is always at the front end of the tank and when it mates with the permanent anchorages on the truck, he can stop the movement within a fraction of an inch by removing his finger from the control button.

For loading the tanks from the truck to the car, the operation is reversed, the driver holding his finger on the "Reverse" button. To date, over 2,800 interchanges have been so effected by drivers without any mechanical or electrical failures.

Any 40-ft. or 42-ft. 6-in. flat car may be equipped for this service, as well as the newer type 50-ft. cars which can transport safely five tanks, or 12,500 gal., of raw milk, or, in the same type of container, petroleum products, chemicals, acids and other liquid freight.

The equipment is such that containers for solid freight can be loaded laterally on the same type of car and be handled by the same conveyor apparatus that unloads the milk tanks; or, if desired, highway truck bodies 8 ft. wide and anywhere between 12 and 24 ft. in length can be transported.

THE GERMAN STATE RAILWAY is undertaking the electrification of 345 kilometers (214 miles) of line between Nuremburg, Halle and Leipzig, at a total cost of approximately 118,000,000 reichsmarks ($47,200,000), of which 46,000,000 R.M. will be expended for new rolling stock. It is expected that the work will be completed on the line between Nuremburg and Saalfield by the middle of 1939, while that between Saalfield, Halle and Leipzig will be ready for electric operation sometime in 1940.

Streamline Locomotives For The Chicago & North Western

(*Continued from page 307*)

gine and tender, matching similar stripes on the cars; they converge at a point just above the front coupler opening.

Except at the rear of the cab and at the front steps over the cylinders, there is no skirt below the tops of the drivers. Motion work parts and the lower part of the firebox and ash pan are exposed for inspection. The front is hinged to provide ready access to smokebox and air pumps. The shrouding at the front of the locomotive is set back of a vertical line through the coupler pulling faces to permit two of these locomotives to be coupled head on.

The tender is built up on a Commonwealth cast-steel water-bottom frame with electrically welded steel-plate tank. The tank is 40 ft. long, 10 ft. 6 in. wide and 87 in. deep. The tender-truck wheel base is 11 ft. and the total tender wheel base is 34 ft. 11½ in. The tender trucks are General Steel Castings six-wheel non-swing motion, center-bearing trucks, with cast-steel side frames, Davis cast-steel wheels and Simplex unit cylinder clasp brakes having two brake cylinders per truck. A. S. F. roller-bearing units are used on the tender wheels in combination with outside journal boxes. The tender draft gear is the Miner velvet-action passenger gear with A. S. F. cast-steel yoke and National Malleable Type E coupler.

Wood Preservation— And the Railways

(*Continued from page 321*)

workings and to extend the life of the sills, draft timbers and other parts of the car it was decided to use treated wood throughout in their construction. This change was made about 10 years ago, since which time the trouble with abrasion has largely ceased, and none of the floors or sides have since been replaced because of this type of failure. The explanation of this longer life is the same as that for crossing plank and trucking floors. The preservative treatment of the timber prevents decay from getting a foothold in the wood, so that its natural resistance to abrasion is not impaired.

That numerous members of freight cars can be treated to advantage is indicated by a study made recently by a committee of mechanical officers in which it was pointed out that treated wood can be used to some degree in practically every type of car except those of all-steel construction. This committee pointed out that where there is danger of contamination of the lading, salt treatments are available. More specifically this committee pointed out that in box cars running boards, running-board saddles and the sub-nailers for floors can be creosoted and the remaining parts, except floors and lining, can be given a "clean treatment," while in open-top cars the floors, sides and the stringers used as nailers can be treated. It also reported that the floors and nailers of flat cars can well be treated while in stock cars any form of treatment is suitable for the floors, subsills, posts and roofs, although the slats require a "clean" treatment. In addition to longer life and consequent lower maintenance, preservative treatment enables cheaper grades of wood to be used here as elsewhere.

While the railways are now effecting savings aggregating many millions of dollars annually through their use of treated timber in track, bridge, pole line and building construction, in other fields of wood utilization they have scarcely begun to achieve the economies possible. With so many demonstrations of the possibilities of timber treatment immediately at hand on their own properties and with full knowledge available within their own organizations of the possibilities available through the various forms of treatment, the railways still offer a large and fertile field for the further extension of treatment to those large remaining applications of timber untreated.

New Books...

Twenty-fifth Anniversary Blue Book—National Association of Waste Material Dealers, Inc. 400 pages. 7½ in. by 10½ in. Bound in flexible cloth. Published by the Association, Times Building, New York. Price $5.

Waste baskets and scrap yards of railroads and factories have become such important sources of income and of raw material and the business and economics of scrap disposal have become so specialized that the directory and reference book which the waste dealers have prepared is a welcome contribution to present information about the business for those who sell and handle waste material as well as those who buy it. Railroads, apparently, fall in all three categories.

The publishers are primarily an association of dealers in non-ferrous metals, non-metallic scrap and pulp wood and therefore devoted the book more largely to such materials than to iron and steel scrap. The book is also deficient in information as to the size of the business and its importance. However, it has been ten years since the Association prepared a similar book, and it is without doubt the most useful handbook on waste material which has been prepared up to the present.

The book includes all classifications, specification and trade customs governing the sale of scrap, including the Association of American Railroads classification of iron and steel scrap, also lists of foreign testing companies and trade associations, arbitration codes and regulations governing foreign tariff, customs, etc. It explains the regulations covering the transportation of scrap in this country, including rules of storage, marking, loading, demurrage, rate adjustments, penalties, liabilities, etc., and a statistical section covers a quarter of a century of market changes and import and export figures on waste material and wood pulp. Contracts, rejected materials, conditions of delivery, inspection, authorized weights and quantities, and definitions of terms, bills of sale, etc., are also considered in the text.

The Formation of the New England Railroad Systems, by George Pierce Baker. 283 pages. 8¾ in. by 6 in. Bound in cloth. Published by Harvard University Press, Cambridge, Mass. Price $3.50.

Professor Baker in this work probes the chaotic mass of mergers, consolidations, operating agreements and "controls" of the New England roads from 1830 to 1900 with a fine-tooth comb, and has produced a well-ordered record of what took place. He ends his investigation at the turn of the century, because the New England systems had then attained a form and distribution comparable to that of today. In this connection, he indicates his intention to take up the present century in a second volume, which will feature the attempt of the New Haven to control the section's transport, and present-day plans.

To keep the reader straight, Prof. Baker has introduced what he calls "control charts," which take the form of the usual sports tournament chart, in which each original company "loses" to the final controlling road. With each change in corporate set-up there is indicated the year of occurrence and a letter indicating one of nine types of acquisition or control defined in the author's introduction. For each system standing at the end of the century, there is a chart of this type, which contains the whole story of its formation. In the same way, a chapter of

text is provided for each system and simple maps, containing only the relevant data, bring out the division of traffic fields, strategic location, etc., which the author seeks to emphasize.

A final chapter sets forth a number of significant features in the New England consolidation process. Prof. Baker has found, for example, that there was no clear-cut relation between business conditions and the frequency or extent of control acquisition. It is his observation that "prosperity and railroad construction went hand in hand, while once the tracks had been laid, a series of events was started which inevitably led to combination whether business was healthy or not."

While the popularity of the different forms of control varied greatly according to systems and years, it is clear that the lease was the mode most frequently resorted to, being used three times as often as the next most popular form, "financial control." Consolidation was third in frequency.

The author departs in one place from his strictly factual presentation to express the opinion that an "emotional motivation" played an important part in many of these railroad combinations; that "a rational desire for operating economies, for a cessation of competition, or for increased traffic does not completely explain the inevitable progress of combination. . . . The knowledge that in competition there is waste leads men to join their properties no more than the fallacious but subconsciously motivating emotional belief that size and greatness go together."

Profitable Public Relations, by Bronson Batchelor. 252 pages. 8½ in. by 5½ in. Bound in cloth. Published by Harper & Brothers, New York. Price $2.50.

Public relations has long been a major concern of the railroads,—or should be. Mr. Batchelor's book is the answer to executives who ask, "What is this business of public opinion about, anyway?" It is *not* a text book on how to induce newspapers to publish free publicity.

The most valuable element in the book, in this reviewer's estimation, is its wealth of illustrations taken from the interesting and far-too-little-publicized annals of American business. To cite but two, which concern railroading, the author recalls that Ivy Lee once persuaded the Pennsylvania that "the public is entitled to accurate and authoritative information" and affords "honorable mention" to James Keeley of the "Chicago Tribune" who, he claims, put Pullman in the forefront of the company of respected corporations by his organization of a public information department. Such anecdotes appear to be far more significant than volumes of text books on the subject.

Mr. Batchelor discusses not only principles and techniques of the profession of public relations work, but uncovers the background of the whole question. giving much weight to the increasing problems of regulation, labor unrest and "Babbitt-baiting." His chapter on "The Right to Information" is an eloquent plea for the abandonment of corporate secrecy and for a new approach to "giving out news about the big boys."

Government Regulation of Transportation, by Emory R. Johnson. 8½ in. by 5¾ in. Bound in cloth. Published by D. Appleton-Century Company, Inc., New York. Price $5.00.

Dr. Johnson, professor emeritus of transportation at the Wharton School of Finance and Commerce at the University of Pennsylvania, whose books on railway transportation have been accorded wide reception as standard texts in the field, has come through with another major work on the subject, imbued with his characteristic thoroughness and depth. This time he has expanded his treatment of government regulation to embrace an entire volume and has brought up to date those views expressed on this particular topic in individual chapters of previous texts. Regulation of highway, water and air transport is also treated in detail in the volume, which will prove of real value to railroad men who seek comparisons among the various competing carrier agencies.

The book is far more than a factual presentation, although, as this alone, it deserves a careful reading. Beyond such presentation of what has been done in regulation since formation of the first state railroad commission and a careful analysis of the present set-up, the book is replete with the author's own views, which, set beside the nonsense which characterizes the bulk of contemporary public pronouncements on "the transportation crisis," will stand out as the well-digested thoughts of one who "speaks with authority and not as the scribes."

For example, there is much talk these days of the need for opportunity of self-regulation in the railroad business; here it is stated concisely by the author in a half-prophetic manner: "It is also not impossible that the experience of the Government in seeking to further the control of competitive practices by business itself through associated action may reveal the possibility of substituting self-control for a part of the government regulation now exercised in the case of rail and motor carriers, and presumably to be exercised as regards other carriers in the future."

Again, the news are full of proposals for Congress to "pass a law" setting railroad rates for this and that. Mr. Johnson comments: "The legislature has the added duty of refraining from subsequently passing laws requiring the Commission to take specific action regarding matters upon which it would otherwise act in a discretionary manner under the general provisions of the fundamental act of the legislature . . . whether or not the purpose of the special legislation be political, the effect is to limit the ability of the Commission to exercise its discretion in deciding questions in accordance with its judgment as to what is in the public interest."

Treating of labors' political "pressure groups," the author claims that enactment of the Adamson law was "hasty" because of the threatened strike of 1916, and adds that "it is much to be regretted that Congress should have been forced to carry out the mandate of a particular group or interest, as it was in 1916, in order to cause that group to refrain from bringing a catastrophe upon the country." And of excessive wages, he writes: "It is thus evident that, in adopting a policy of government regulation of railroad labor, attention should be given to the relation of wages to the revenues and expenditures of the railroads as well as to the attainment of abstract ideals of employment and social standards."

Mr. Johnson's classification of this complicated subject is a most happy one in that it aids the reader in remembering the facts of regulation in neat categories. The constant broadening of the commission's powers through successive acts of empowerment, as treated in this work, makes interesting reading and constitutes excellent reference material.

The chapter on railroad competition and consolidation is an especially fine one, presenting as it does a straightforward, crystal-clear picture of the gradual changes in public and government attitudes on these issues. Its treatment of the present consolidation problem is noteworthy in its breadth and consideration of most of the many current proposals, but the author does not hesitate to sound his own views on the question, which embrace the general policy that "the consolidation of the railroads in the United States by building up and around the larger and stronger existing systems is preferable to dividing the country's railway net territorially and placing the railroads in each district in the ownership and under the operation of a newly-created corporation."

The National Railroad Adjustment Board, by William H. Spencer. 65 pages. 9½ in. by 6¾ in. Bound in Cloth. Published by the University of Chicago Press, Chicago, Ill. Price $1.

The dean of the University of Chicago's School of Business Administration here presents a survey of some of the relatively inconsequential technical aspects of the work of the National Adjustment Board, omitting entirely any reference to the wealth of available evidence that the Board, as it is now constituted and now conducts its business, is doing more to corrupt harmonious and just union-management relationships in the railroad industry than it is to foster them. The dean, it so happens, was the referee for the Adjustment Board who handed down the award of $240,000 of "back pay" to Lehigh Valley train service employees—8 hours' of wages for each trip of train between Pennsylvania Station, New York, and the coach yard, in addition to wages received for their road run.

Professor Spencer argues that it is futile to pin any label on the board as yet. He admits that, with the consultation of referees, the four divisions have sustained the position of employees in approximately 69 per cent of the total awards, but insists that

"time alone will tell whether the awards work out substantial justice for all parties concerned."

The first part of the book is an historical re-hash of the origin of the National Railroad Adjustment Board in the much-amended Railway Labor Act and of its essential nature. Readers are told that the "board" is actually four boards or "divisions" and that the latter never meet as a unit; that some 33 per cent of the cases come under the "deadlock" category and are ultimately decided by a referee who is outside the railroad business and allegedly disinterested; that 12 different persons, almost entirely appointees of the National Mediation Board, have served as referees since the board started to function in the latter part of 1934.

Certain other peculiarities of the board's operations are outlined by the author. The board, for example, has no power to compel the attendance of parties or witnesses nor to compel the submission of documentary evidence. Again, it has no right to examine witnesses under oath, and the Railway Labor Act cites no penalties for the failure of parties to comply with orders of the board.

In appraising the qualifications of referees, the author commits himself to the extent only of declaring that, "with one or two exceptions," they have dealt with controversies competently and effectively; further he points out that this evaluation is "aside from the question of bias—an issue on which the writer does not care to express a judgment." In subsequent passages, in discussing various proposals for improving the quality of referees, he rejects the plan for a permanent chairman of the board, but indicates a preference for a panel of some 12 to 15 "neutral" persons recommended by the Mediation Board from which each division of the Adjustment Board might select a referee, as needed, by agreement, lot or preferential voting.

Agenda Dunod Chemins de Fer. By P. Place, Chief Engineer, l'Office Central d'Etudes de Material de Chemins de Fer. Published by Dunod, 92 Rue Bonaparte, Paris. 463 pages, 4 in. by 6 in. Price 25 francs.

This annual, which has been considerably revised since the 1937 edition, contains a large amount of concise data pertaining to railroad operation, track construction, signals, steam and electric locomotives, passenger and freight equipment cars. Details of construction and equipment are given for both locomotives and cars. The book also contains considerable statistical and general engineering information in tabulated form.

Communications . . .

Employees Would Be Loyal If They Held R. R. Securities

PALESTINE, TEX.

TO THE EDITOR:

In Texas we have just closed the most spectacular governor's election that was ever held in Texas and the winner, W. Lee O'Daniel, was only in the race 8 weeks and won a clear majority over his 11 other opponents.

Thousands are asking how he did it. To my mind, the way Mr. O'Daniel put his program over was that he got every one of his hearers to invest something in his campaign. In every political rally he held, he had a small keg that was passed through the crowd and he asked every man, woman and child to put in a penny. He said he wanted the people to pay for his campaign and if they would just put in a penny for each person that it would more than pay for it.

Now this man did not need this money. He is said to be worth a half million dollars, but he knew that a person will fight for anything he puts his money into, even though it be a small amount. I am told that he gave away every cent that he took in in this manner. Is not this idea one for the railroads to take to heart?

Why not encourage railroad employees to acquire a financial interest in the railroads? Select a certain railroad system and send a good man out over the lines in an educational move to sell railroad securities. Ask each employee to buy $50 worth of their railroad stock and to sign a deduction order for this much payable $2.50 or $5.00 a payday until paid for—but the stock to be bought at the time they subscribe for it and held in escrow for them until they have completed paying. Then turn their stock over to them and encourage them to buy another stipulated amount.

In this way every railroad employee in the country would be boosting for his railroad because he will have some money tied up in that railroad. You will say, "Why don't they do that anyway? This is where their bread and meat comes from." All true—but they look on this as a matter of fact. But let them buy some stock in that same railroad and you will see a change in the railroad men of the entire country and you will see a decided change in the railroads themselves for they will have thousands of boosters that are looking at it from an investors' standpoint and not from an employee standpoint.

Of course this idea will meet with some opposition at first and the man that takes charge of such a proposition can expect such a thing, but if he has "guts" enough to stick to it he can really put something over for his railroad.

F. C. EPPNER

Radio and Other Menaces To Passenger Comfort

NEW YORK.

TO THE EDITOR:

The following episodes may not surprise those of your readers who are on trains constantly. They were events which, however, caused me to engage in a bit of reflection.

Enroute to Gettysburg for the commemoration of the battle there: Hundreds of women and girls poured on to the train, stating that they feared to use their cars because of traffic congestion. Conversations overheard, and questions asked, indicated that most of the girls up to 20 years of age were taking the first ride on a railroad train in their lives. (And the circumstances of that ride, in crowded, non-air-conditioned cars, in which the windows could be opened only by breaking them, were not conducive to winning their complete approbation of rail travel.)

A woman in the west, on a pass, conversing with another employee: "Isn't the wage-cut dreadful? The railroads don't need that money."

Radios blatting all the way across prairies—baseball, baseball, jazz, jazz, until it was enough to drive a sane passenger from the observation, either to his sleeper, or completely "nuts." The only time I heard any decent music, an employee leaped for the radio and cut it off in its infancy.

Porters making up berths after 6.00 a. m. on all trains used, in their anxiety to clean up their cars so as to be off duty when they reach terminals early in the morning. Late sleep (after 6.15 a. m.) is a privilege which payment for space does not appear to include.

Amazing range in dining car prices on roads adjacent to one another. A 60-cent lunch costs $1.25 on a nearby line, and the cheaper one was the better, at that.

Surprising vigilance on one road by flagman, who took the "high-balls" from every employee at every station, tower, yard, section-crew, crossing-tender and passing train and acknowledged every one in run of 85 miles. Complete failure to do the same on some other roads.

Indifference of one train-crew to G. A. R. veterans, bound home, on an evening train which had no diner and who had not had anything to eat before boarding the train. If one passenger had not wired ahead for food for them to be placed aboard the train they would have retired without food, for all any employee cared about their welfare.

Station-master at a terminal who was amazed that request should be made that taxi be drawn up near the tracks for an elderly person rather than force her to walk half a mile past a 15-car train, then down steps, through a tunnel and up an incline to a taxi stand, despite the fact that the logical spot for taxi stand would be at vacant spot not 25 yards from rear-

end of all trains. Gates locked at a station to forbid anyone to go down a platform to meet incoming passengers, although this is now permitted at virtually every station in the country.

Employee who said he "didn't care a damn if the railroads went into government ownership or not, for we're gonna fight to git ours no matter who owns 'em.

"They're all paying 6 or 7 per cent interest to Wall Street and they can pay us, too."

Pullman conductors and even porters-in-charge doing the work of train-conductors in lifting railroad tickets.

Trainman entering smoking compartment of sleeper and announcing that there were two rules he wouldn't obey, one being to keep his coat buttoned while going without a vest and the other, not to smoke when he wanted to.

Unfailing courtesy in every diner used, by all members of the crews thereof.

Woman passenger telling train-crew she could drive between two cities enroute two hours faster than the train. They raised their brows politely and smiled, but failed to argue with her, evidently to her disgust.

Air-conditioning apparatus cutting on repeatedly in parked sleepers, awakening everyone by the noise and vibration of the car.

Seriously, the radio situation is a grave problem. It well may be that the majority of travelers are of a type who welcome this type of entertainment, but assuredly some protection should be accorded persons whose attainments do not reach such heights that they can stand this type of stuff for six hours at a stretch.

FRANKLIN SNOW.

Is Younger Employees' Case Hopeless?

TO THE EDITOR:

BAKERSFIELD, CAL.

Your editorial in *Railway Age*, July 16, and current discussion in the Communications column strike me as more amusing than anything else.

Most of your communications are from junior employees or outsiders. Being a junior employee myself, what amuses me is the fact that you are bravely waging a battle to better conditions for me and my fellow workers who are making an uphill struggle to keep ourselves and our families alive; but, the only ones who can help us—managements and brotherhoods—calmly ignore the hue and cry, leaving you and us to make a fuss about it and yet achieve nothing.

There are only three parties directly concerned in this controversy; the managements, the brotherhoods, and we younger men who cannot obtain steady work.

The managements seem unable to correct this inequality; the existing agreements tie them hand and foot. Am I not correct in assuming the attitude of the managements to be one of a strict "hands off" policy? No comments on the general attitudes of the many managements has come to my notice in the *Railway Age* recently.

The brotherhoods, controlled as they are by the older men, have no sympathy with our plight. We can expect no assistance from this quarter. Why shouldn't they take advantage of a situation they control so completely? Our federal government encourages such an attitude; can you blame them for falling into line?

The younger men are the lonely and friendless ones. They have no one to turn to for encouragement or help. One cannot find a single plausible reason why they should choose to remain on the crowded extra boards in the vain pitiful hope of an infrequent and feeble scattering of pennies at uncertain times.

My own case is no exception. I use it only as a representative example; there are some 30 younger men on my extra board in the same plight as myself.

We were hired during the boom of business in the early part of 1937; just too late. Those hired as brakemen in 1936 are working steadily, while we who made our student trips in the winter and spring of early 1937 are living on relief. It so happens that ours is one of the few extra boards left on this railroad which works as a straight seniority board. We are perpetually on call, but never called. We go to the yard office each day hopefully; look for our names on the board; count the men above us, and sadly return home to say "20 times out . . . not a chance." Occasionally we find our name near the top of the board and grow hopeful. By the time the next train is made up the older men who have returned from trips and gotten their rest, or men who have laid off to visit a racetrack, have marked up ahead of us and once more our name drops back to 20th place.

We get a cheap, wretched, office job. This is Los Angeles where only experienced male help is paid as high as $60 a month. We don't get that much. And invariably, after we have worked a week or so and brought home $15, the callboy finally knocks at our cottage and at last we go to work on the railroad. We work poorly. What man can become familiar with his work if he performs it only once each three months? Conductors and regular men become impatient; threaten to turn us in. They have only contempt for us who cannot even perform our jobs capably after watering at the mouth for months just looking forward to this chance.

Perhaps we get another call right after we return from the previous trip. We gain courage and apply for membership in the brotherhood. Lord knows we want to remain in good standing and have assistance in protecting our job.

Next time the caller fails to appear; our job is gone, and at the end of the month we receive a smudgy note from the local chairman of our brotherhood, telling us we have been dropped for failure to pay dues. Pay dues? Why should we when we are fast using up our last bit of credit with the grocery store?

So what do we do? The answer is obvious: go on relief. There are twenty men I know of today who are sleeping on a shovel with the W. P. A. in Los Angeles, who are at the same time hired out as brakemen on the railroad and "on call."

Who cares? Nobody pays any attention to some mythical ruling that is said to be: "Trainmen shall keep a check of their mileage and when they have made 3800 miles in one calendar month shall lay off until the beginning of the next calendar month." Translated for the benefit of the layman this means: As soon as a brakeman earns $278.16 in a month he shall lay off and allow a junior employee to work from then to the end of that month. Or: 3800 miles equals 38 × 100 miles equals 38, 8-hour working periods at the rate of 8 hours for each 100 miles worked under existing agreements. The rate of pay is $7.32 per 100 miles, so 3800 miles equals $278.16.

However, the 3800-mile limitation is purely mythical. Never has it been seen on paper and never has an old head been found who laid off when he made his $278.16. They just don't give a damn how much money they make. And the funny part of it is that the older a man is the less he lays off. The middle aged men like to spend a day at the racetrack once in a while, but there are old timers who have never been known to take a holiday for love or money. Rain or shine they put in their nine hours, plus . . . sleeping in a caboose, and draw down their fat checks. When business booms they boast of $300 and $400 checks at the end of a month.

Nobody can do anything about it but the brotherhoods and the timid management, and unfortunately they don't seem to be interested. We are for your editorial campaign one hundred per cent, but it does seem kind of useless. What is going to happen?

JUST A STUDENT BRAKEMAN

NEWS

I. C. C. Approves A.C.&Y. Recasting

Reorganization of Northern Ohio included in plan which cuts charges to $180,000

The Interstate Commerce Commission, Division 4, on August 19, promulgated its third final plan of reorganization when it placed its stamp of approval on a plan for reorganizing and consolidating the Akron, Canton & Youngstown and the Northern Ohio. The combined new capitalization of the two roads will amount to $8,500,000 with fixed interest charges of $170,965 on two series of mortgage bonds to be issued to the present bondholders of the two companies.

The new plan, as approved by the commission, will become effective when it is approved by the Federal Court and by the required percentages of security holders. The commission has set October 1 as the effective date of the plan.

The new company will issue and deliver immediately $1,500,000 of new consolidated mortgage four per cent series A bonds due October 1, 1988; $2,173,000 of new consolidated mortgage 4½ per cent series B bonds due October 1, 1988; 22,038 shares of new five per cent preferred stock of a par value of $100 per share; approximately 16,149.1 shares of new common stock of a par value of $100 a share; approximately 6,393.58 class A conditional warrants of *pro rata* participation in the future issue of all or any part of about 4,936.48 shares of additional common stock of a par value of $100 a share; and 15,000 class B conditional warrants of *pro rata* participation in the future issue of all or any part of about 1,901.42 shares of additional common stock of a par value of $100 each. The new corporation would also issue and hold for future delivery as and when it shall be ascertained who shall be entitled to delivery, 6,837.9 shares of additional common stock of a par value of $100.

Holders of general and refunding 6s of the Akron, Canton & Youngstown will receive in exchange for each $1,000 bond accompanied by all interest coupons due April 1, 1935, to April 1, 1945, inclusive, $620 of new consolidated mortgage 4½s Series B, $372 par value of new five per cent preferred stock and $248 par value of new common stock.

Holders of general and refunding 5½s of the A. C. & Y. will receive for each $1,000 bonds accompanied by all interest coupons due April 1, 1935, to April 1, 1945, inclusive, $610 of new consolidated mortgage 4½s Series B, $366 par value of new five per cent preferred stock, and $244 of new common stock.

First mortgage bondholders of the Northern Ohio will receive for each $1,000 bond, accompanied by all interest coupons due April 1, 1939, to October 1, 1945, inclusive, $500 of new consolidated mortgage 4s, Series A, $300 par value of new five per cent preferred stock, and $200 par value of new common stock. Holders of interest coupons detached from the Northern Ohio first mortgage bonds due April 1, or October 1, 1935, 1936, 1937 or 1938, will receive for each such coupon $12.50 of new consolidated mortgage 4s, $7.50 of new preferred, and $5 of new common.

The New York, Chicago & St. Louis, upon presentation of proof of loss sustained in the performance of its guaranty of bonds of the Northern Ohio, will receive for each $100 of loss so proved $22.79 par value of new common stock, and in addition will participate equally with the holders of Class A warrants in any distribution of additional stock. Holders of the stock of the A. C. & Y. will receive in exchange one Class B conditional warrant for each share of stock held.

The Railroad Credit Corporation and the banks holding A. C. & Y. obligations will receive $22.79 par value of new common stock and one Class A conditional warrant for each $100 of claim approved and allowed. The trustees' certificates and equipment trust and equipment leases are to be assumed by the new company.

Each Class A warrant will entitle the holder to participate equally, warrant for warrant, in the future distribution for any stock to be returned by the Railroad Credit Corporation, and about 4,936 shares of new common stock to be issued and held in the treasury at the time of reorganization. Each Class B warrant will entitle the holder to participate in the future distribution of any stock returned by the Railroad Credit Corporation on a different basis.

Holders of miscellaneous claims will receive payment in full without interest in cash; and holders of the preferred stock of the Northern Ohio outstanding in the hands of the public will receive $1 in cash for each share of stock surrendered.

Green Bay & Western Not "in Red"

In the *Railway Age* of August 6 on page 238 net railway operating income of the Green Bay & Western for the first half of 1938 was incorrectly reported as a deficit of $57,277. The total should have been shown as a "black" figure—not a "red" one.

"Olympian" Wreck Ascribed to Piers

Unprecedented volume of water moved piers after scour weakened footings

The disastrous accident to the westbound Olympian of the Chicago, Milwaukee, St. Paul & Pacific at the multiple-span bridge over Custer Creek, near Saugus, Mont., in the early morning of June 19, reported in the *Railway Age* of June 25, was caused by the undermining of several piers of the structure by unprecedented flood conditions in the creek, according to a report issued by the Interstate Commerce Commission. It will be recalled that as a result of this accident, in which the train plunged through the bridge at 12:35 a. m., 47 persons were killed, mostly by drowning, and 75 were injured.

The bridge involved was a single-track, combination steel and reinforced concrete structure of seven spans, with an overall length of 180 ft. 3¼ in. It conformed to the design specifications of the American Railway Engineering Association, and was constructed in 1913-14 to replace a pile and timber trestle which was built originally in 1907. From east to west, the bridge consisted of two 50-ft. through plate girder spans and five reinforced concrete slab spans, each of the latter measuring approximately 16 ft. in length. The girder spans were of conventional construction, with an open deck, while each of the concrete spans consisted of two pre-cast slabs laid parallel between supports.

The substructure of the bridge included two abutments and six piers, all of concrete construction. The footing of Pier 1 at the east end of the bridge extended 9½ ft. below the normal bed of the stream; Pier 2 extended 7 ft. below the normal bed of the stream, while Piers 3 to 6, inclusive, all out of the normal stream channel, extended to a depth of 4½ ft. below the normal ground level. The piers rested on firm gravel and, when built, the east abutment and Piers 1, 2, and 3 were heavily rip-rapped. In 1935, as an added precautionary measure, about 100 cu. yd. of rip-rapping were placed about each of Piers 1 and 2, and about 50 cu. yd. rip-rapping were placed about each of Piers 3, 4 and 5.

At no time prior to the accident had the integrity of the bridge been questioned, and no orders had ever been issued affecting train operation over the bridge other than the speed restriction of 65 m.p.h.

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Motorist Worm Turns on Trucks

New D. C. group not to stooge for commercial carriers, but curb them instead

Organized Motorists, Incorporated, a non-profit association, has been chartered in Washington, D. C. to "represent, protect and obtain for owners of private passenger automobiles their rights and privileges in the use of public highways being usurped or threatened by trucks and buses." The organization plans a "Nation-wide campaign to bind together owners and operators of passenger automobiles."

The president of the new organization is Charles J. Tilden, chairman of the Committee on Transportation at Yale University, president of the Eno Foundation for Highway Traffic Control, Inc., and at one time highway research specialist for the Bureau of Public Roads. William Sabine of Washington, D. C., is the executive vice-president. The board of directors include Walter B. Clarkson, vice-president of the Chesapeake & Potomac Telephone Company of Washington, D. C.; Charles H. Doing, vice-president of the Washington Loan & Trust Co., Washington, D. C.; C. F. Jacobsen, cashier of the National Metropolitan Bank, Washington, D. C.; Stanley Quinn, public relations counsel, New York City; Paul Sleman, lawyer, Washington, D. C.; and Hon. Frederick Steiwer, Washington attorney and lately U. S. Senator from Oregon.

The organization intends to "deal collectively with questions of highway use and safety as affected by federal and state regulation, and particularly to obtain more stringent and uniform regulation of buses and trucks, their size and speed." The announcement stresses the fact that it is a non-profit organization which is not subsidized by any special interests.

General membership dues are $2 a year with sustaining memberships of $5 a year. Also, enrollment is open in the group classification of Founders of the OMI with annual dues at $50 a year. The group will invite all private automobile owners to become members.

The aims of the organization are set out as follows:

1. Regulate and standardize dimensions, loads, markings, lights, driving rules and inspection of tires, brakes and mechanical equipment of trucks and buses.
2. Coordinate federal and state regulation of buses and trucks.
3. Govern truck and bus speeds to include requiring more uniform speed on up and down grades.
4. Restrict or eliminate use of certain highways and streets by buses and trucks.
5. Induce construction of by-passes for buses and trucks on federal and state highways.
6. Taxation that will be commensurate with the extra wear and tear to highways caused by trucks and buses.
7. Tighten truck and bus drivers license laws to insure more competent operation.
8. Make public officials truck and bus conscious.

Mediation Continues

Mediation of the railroads proposal to reduce wages 15 per cent, which started before the National Mediation Board at Chicago on August 11, continued throughout this week. The three members of the board, Chairman William H. Leiserson, George A. Cook and Otto S. Beyer, have been holding separate meetings with the Carriers' Joint Conference Committee; the Railway Labor Executives Association, representing 18 organizations of railway employees; and the Brotherhood of Railroad Trainmen, continuing their efforts to bring about an agreement. To date no statement has been issued indicating the progress being made.

A meeting of the general chairmen of the brotherhoods who are members of the Railway Labor Executives Association has been called for August 29, for the purpose of discussing the current status of the employees' opposition to the reduction.

"City of Los Angeles" Returned to Service

The original Streamliner "City of Los Angeles," operated by the Union Pacific and the Chicago & North Western between Chicago and Los Angeles, was returned to service on August 18 after being revamped throughout and two cars added, as reported in the *Railway Age* of August 6.

Hearing on R. E. A. Acquisition of Southeastern's Motor Rights

The Interstate Commerce Commission has set for hearing on August 27 at Atlanta, Ga., the application of the Railway Express Agency for authority under the Motor Carrier Act to purchase the motor vehicle operating rights of the Southeastern Express Company. Examiner A. Henry Walter will conduct the case which is docketed as No. MC-F-635.

N. J. Complains of Pennsylvania's Refusal to Allow Coal Increases

The Board of Public Utility Commissioners of New Jersey has filed with the Interstate Commerce Commission a memorandum, complaining that the action of the Public Utility Commission of Pennsylvania in suspending tariffs proposing Pennsylvania intra-state increases of rates on anthracite coal in accordance with the Ex Parte 123 decision gives an undue preference to Pennsylvania retail coal dealers in competition with New Jersey dealers.

The memorandum asks the commission to grant "such relief as may be proper, adequate and just." The Pennsylvania situation is one of several wherein the commission is now conducting investigations into the failure of state authorities to allow Ex Parte 123 increases.

R. R.s Would Keep Coal Rate Boost

Ask I. C. C. to extend Ex Parte 115 bituminous increases beyond December 31

Asserting their "desperate need" for additional revenue, Class I railroads in a petition filed through the Association of American Railroads on August 19 asked the Interstate Commerce Commission to continue in effect the increases in freight rates on bituminous coal which were granted on October 19, 1937, but which terminate on December 31, next. These are the Ex Parte 115 increases which the commission refused to allow on a permanent basis without consideration of a possible pooling arrangement, in view of the fact that a large part of the resultant revenue would accrue to the relatively prosperous Pocahontas lines.

The railroad petition submits in the latter connection that the commission "is without power directly, or indirectly, without the consent of all of the carriers involved, to require them, or any of them, by the imposition of conditions, or otherwise, to enter any kind of a pooling arrangement or agreement." It is conceded that the Pocahontas lines have been "relatively more prosperous" than other roads, but at no time has their prosperity been such as to "shock the conscience" of any one; they earned a 7.58 per cent return in 1936 and 6.61 per cent in 1937.

Furthermore, the Pocahontas lines, "because of the extraordinary and unexpected decrease in their revenues, are unwilling to enter into any arrangement for the redistribution to other petitioners of their earnings from the increases authorized on bituminous coal, as a condition to their continuance beyond December 31, 1938;" and petitioners other than the Pocahontas lines "are equally opposed to the principle of the compulsory pooling or compulsory adjustment of divisions except in accordance with the governing statute, and feel that, under the existing circumstances, it would be most inequitable and unjust to deprive them of the benefit of these increased coal rates after December 31, 1938, solely because of the unwillingness of the Pocahontas lines to give up . . . all or part of their revenues therefrom."

The increases which the railroads seek to keep in effect amount to three cents per net ton in rates of 75 cents and less, five cents in rates from 76 cents to $1 and 10 cents in rates over $1, and, in the case of rates within and to Western territory, an increase of 15 cents in rates over $2.

The petition pointed out that costs are on a higher level and traffic is on a much lower level than in 1937. "Petitioners assert," it said, "that the highly critical condition existing at the time of the filing of the petition in Ex Parte 123 has become even more serious. Since that time the financial situation of the railroads has grown progressively worse and petitioners' need for increased revenues has become much more imperative. For the first five

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Not All Short Hauls Cheaper by Truck

In some cases at least those "inherent advantages" seem to be with railroads

Those much-talked-of "inherent advantages" of the motor truck in the short-haul field evidently do not always include lower costs, if reliance is to be placed on comparative data compiled in accordance with formulae developed by the Interstate Commerce Commission's Bureau of Statistics and made public in Examiner Charles M. Bardwell's proposed report in the case involving rates on naval stores from Mississippi points to Gulf ports. The figures show that the railroads have a cost advantage on all of the routes for which the comparative data were available; the rail distances range from 71 miles to 186 miles, while the competitive highway routes range from 72 miles to 125 miles.

On the basis of the cost figures Examiner Bardwell recommends in some instances that the commission permit the railroads' proposed truck-compelled rates to become effective; but he would in a couple of cases prescribe minimums higher than those proposed by the railroads, while in others he would reject the railroad proposals because of a lack of truck competition. In his discussion of the case's general aspects he warned that the cost figures "cannot be taken as typical of handling railway and truck traffic for relatively short hauls, ranging from 71 to 185 miles." The railway costs, he explains, "are low because of favorable operating conditions, the lack of empty car haul, and the average naval stores load of about 27 tons; the truck costs are unfavorably affected by the empty haul in one direction and the average load of only eight tons." In the accompanying table the costs are compared with the present rates and with the proposed rail rates.

COMPARISON OF COSTS WITH PRESENT RATES AND PROPOSED RAIL RATES

		Rates and costs in cents per 100 pounds						
		Rail rates		Rail costs			Truck costs	
From—	To—	Present	Proposed	Excluding return on investment	Including return on investment	Truck rate	Excluding return	Including return
ROSIN								
Hattiesburg	Gulfport	11	6	4.14	5.73	8.5	7.38	7.40
Columbia	Gulfport	11	8	6.63	9.18	9	9.81	9.90
Laurel	Gulfport	11	8	...	...	9	...	9.80
Laurel	Mobile	11	8	5.97	7.69	10	15.39‡	15.65‡
Columbia	New Orleans .	11	8	8.32*	10.78*		No truck service	
				9.47†	12.94†			
PINE OIL								
Hattiesburg	Gulfport	22	9	...	...	12	9.31	9.40
Columbia	Gulfport	22	12	...	...	13.5	11.0	11.10
Laurel	Gulfport	24	12	...	...	13.5	...	12.90
Laurel	Mobile	25	12	6.71	8.62	10	...	...
Columbia	New Orleans .	22	12	...	...		No truck service	

* Over G. M. & N.

† Over Fernwood, Columbia & Gulf and Illinois Central. Estimated by assuming that terminal costs are the same as for the movement over the G. M. & N. and that line-haul costs for the 146 miles over the Fernwood, Columbia & Gulf and Illinois Central are proportionately greater than for the 100-mile haul over the G. M. & N.

‡ Cornett Trucking Line's costs cover only the month of January, 1938.

If the commission adopts the examiner's recommendations it would O. K. for the rail transportation of rosin the proposed 6-cent rate from Hattiesburg to Gulfport, and the proposed 8-cent rate from Laurel to Mobile; it would up the carriers one cent, prescribing minimum rates of 9 cents from Columbia and Laurel to Gulfport, and it would require the maintenance of the present 11-cent rate from Columbia to New Orleans where the examiner finds there is no truck service. With respect to the rates on pine oil the examiner recommends approval of the railway proposals in all instances, save the 12-cent rate from Columbia to New Orleans; because no truck service is available he would there require maintenance of the present 22-cent rate.

The investigation of the comparative costs of rail and truck transportation on these routes developed after the proposed truck-compelled rates of the railroads had been suspended and the commission, upon its own motion, launched an inquiry with a view to determining whether the rates and practices of the respondent rail carriers "are inconsistent with economical and efficient management and service, or are unjust, unreasonable, or in any respect in violation of law." Examiner Bardwell, after explaining the nature of the traffic involved, pointed out that following a post-war slump the naval stores industry in southern Mississippi "has taken on a new lease of life" due to a new process for extracting rosin, turpentine and pine oil from waste pine stumpage. Because of truck competition this boom did not bring corresponding increases in traffic to the railroads—the Gulf, Mobile & Northern and the Gulf & Ship Island. These roads, for example, in 1937 handled only 38 per cent of the traffic out of Columbia, as compared with 89 per cent in 1936. Their principal competitor was a contract trucker, the Evans Motor Freight Lines, and reductions in rail rates made prior to those proposed in the schedules under suspension did not meet the competition.

With the issue of comparative costs thus brought into the proceeding each of the carriers involved was asked to submit data in accordance with questionnaires prepared by the Bureau of Statistics; but each "was also informed that it might express agreement, or disagreement, with all or any part of the method or schedules of the questionnaire and might furnish additional

(*Continued on page 335*)

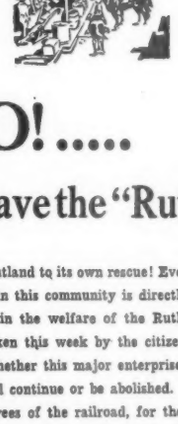
"Save the Rutland" Program Expanded

Parade and mass meeting for Rutlanders scheduled; fund reaches $10,000

With fanfare and enthusiasm, with hard-headed business sense and considerable digging down in the cash pocket, those who find their homes and business along the line of the threatened Rutland railroad have pushed along their "Save the Rutland" campaign in the effort to preserve railroad service for the future. The city of Rutland, Vt., and nearby towns, which area has the greatest stake in the road, "ran off" a vivacious parade on the evening of Tuesday, August 23, under the

SHALL WE.....

GO BACK TO THIS?



NO!.....

Let's Save the "Rutland"!

At last, it's Rutland to its own rescue! Every man, woman and child in this community is directly or indirectly interested in the welfare of the Rutland Railroad. The stand taken this week by the citizens of Rutland will decide whether this major enterprise, affecting all Vermont, shall continue or be abolished. For the sake of the employees of the railroad, for the sake of ourselves, and our community we must "Save the Rutland." You can help! Subscribe generously to the fund now being raised! We must keep the Rutland rolling!

DO YOUR PART TODAY!

"SAVE THE RUTLAND"
CAMPAIGN COMMITTEE

When a Class I Railroad Is on the Verge . . . This Ad Appeared in the Rutland (Vt.) "Herald"

sponsorship of the "Save the Rutland" Club, a voluntary organization originated by citizens of the locality. In the line of march, as described by the Rutland "Herald," more than 15 trucks representing Rutland stores and business firms, a large group of civic officials, members and local general chairman of the railroad employee organizations, and numerous citizens and club members. They marched to the strains of music played by the Rutland city band, a farmers' "orchestry," the Mt. St. Joseph boys' school band and the Boy Scout and American Legion fife and drum corps. The whole retinue was headed by Rutland's fire chief and the fire department's service truck and followed at the rear by a superannuated horse vehicle and a still more ancient ox-cart to warn spectators that the loss of railroad transportation would be a tremendously backward step.

The "Save the Rutland" Club had also scheduled a large mass meeting at the Rutland Armory on Thursday, August 25, for the purpose of explaining to citizens the necessity of supporting efforts to save the railroad from abandonment. The main speaker of the evening was announced as Col. Jim Healy, a radio commentator of Albany, N. Y., whose topic was "A Challenge to Vermont, a Challenge to Rutland; Help Yourself; Save Your Railroad." It is reported that the speaker sought, in the main, to emphasize that the crisis in the affairs of the railroad has by no means ceased because of the temporary settlement of wages and possible adjustments in taxes, and that the line must be put on a sound earning basis for permanent financial stability.

The subscription fund sought by the Rutland Railroad Co-operating Traffic Association had reached a total of almost $10,000 in donations or pledges at the close of August 21. Of this amount, firms and individuals in Rutland and vicinity had given a total of $7884, while other communities along the road had subscribed the remainder. The largest single subscription received was for the amount of $1045, given by the Clement National Bank.

Two letters to the editor of the Rutland "Herald" and published in the issue of August 22 illustrate the trends of thought pursued by an aroused citizenry. One writer pleads for the election of a certain candidate for state senator because of his 16-year service record in the railroad industry, adding, "This year, particularly, Rutland needs railroad-minded men on the Legislature." The other correspondent ventures the following laconic expression of opinion: "I have not yet purchased my fuel for the coming winter. I am ready to be sold by a dealer who receives his product exclusively over the Rutland railroad. Why don't we all do it?"

Pennsylvania Greyhound Route

Joint Board No. 112, composed of P. L. Holland of Maryland, has recommended in a proposed report that the Interstate Commerce Commission grant a common-carrier bus certificate to the Pennsylvania Greyhound Lines, affiliate of the Pennsylvania, for operations between Aberdeen, Md., and Baltimore.

L. & N. Restores Free Pick-Up and Delivery in Kentucky

The Louisville & Nashville on August 15 restored, subject to certain exceptions, free store-door pick-up and delivery service on less-than-carload merchandise shipments moving between points within Kentucky. Since 1936 a charge of 5 cents per hundred has been made for pick-up, with a like amount for delivery. Under the new arrangement, free pick-up and delivery will be provided within designated limits of city or town. The service applies on practically all articles of less-than-carload freight, there being some excepted commodities. C. O. D. service is available at a nominal charge, whereby the railroad will collect from consignees and remit to shippers the amount of the invoice covering the shipment.

These Patient Oxen Warn Vermonters That Post-Railroad Days Might Resemble Pre-Railroad Days

I. C. C. Airmail Employees Transferred to C. A. A.

President Roosevelt has signed an executive order transferring all employees, equipment, records and unexpended funds of the Bureau of Air Commerce and the Airmail Division of the Interstate Commerce Commission to the new Civil Aeronautics Authority. The transfer order affects 2,806 employees in the Bureau of Air Commerce and 59 employees in the Airmail Division of the Interstate Commerce Commission. The new Civil Aeronautics Authority actually began to function on August 23.

International Rail Group to Meet September 19-22

The Fourth International Rail Assembly will convene at Dusseldorf, Germany, September 19 to 22, inclusive. Topics for discussion include: Stresses and Effects on Tracks; Mechanical Tear and Wear; Problems of Experiences Relating to Operation; Tests and Inspection; and Welding. The only representative from the United States scheduled to address the group is J. B. Farwell, president, Sperry Products, Inc., Brooklyn, N. Y., who will present a paper entitled "Experiences with the Welding of Rails in the U. S. A."

The mailing address of the Assembly is given as Verein Deutscher Eisenhuttenleute, Ludwig-Knickmann-Strasse 27, Dusseldorf, Germany.

Propose Reduced Rates on Export Grain

Rate experts of eastern railroads shortly will hold a meeting in Chicago to take action on reducing reshipping rates on export grain moving from the Great Lakes area to Atlantic ports. Plans now call for an early check of the rates so that reductions can be published and made effective on statutory notice not later than October 1. The lower rates are intended to compete with all-water rates from Great Lakes ports to Montreal. During the season of late navigation export grain shipments have been moving from Lake Michigan and Lake Superior by steamers to the eastern Canadian ports, while during the winter months grain export flow has favored Gulf ports.

Chilean State Lines Push Employee Training Courses

The Chilean State Railways reports that, during 1937, a total of 651 employees undertook studies having to do with railroad rolling stock, locomotive operation, and other vocational techniques, in courses offered under the road's educational plan. Some 250 of these students completed the full curriculum. In addition, four members of the staff were graduated from a complete course in mechanics at the Railway Institute at Santiago.

Under a plan whereby the railroad remitted half of the instruction and textbook fees to those fulfilling requirements,

399 additional employees enrolled in courses offered by a correspondence school located in the United States. Officers of the road have also authorized the re-opening of an apprentice training course in the shops at San Bernardo, and examinations have been given to employees seeking the 30 vacancies made available.

July Locomotive Shipments

July shipments of railroad locomotives, as reported by the country's principal manufacturing plants to the United States Department of Commerce, totaled 27 locomotives as compared with 21 in June and 49 in July, 1937. The seven-months total was 199 as compared with last year's 271. The July figure included eight steam locomotives and 19 Diesel-electrics, all for domestic service, as compared with 33 steam and 15 Diesel-electrics for domestic service and one Diesel-electric for export in July, 1937.

Unfilled orders at the end of July totaled 64 locomotives, including 18 steam, 20 electrics and 18 Diesel-electrics for domestic service and seven steam and one Diesel-electric for export; at the close of July, 1937, there were unfilled orders for 373 locomotives, including 254 steam, 26 electrics and 53 Diesel-electrics for domestic service and 40 steam for export.

The data do not include locomotives built in railroad shops or "self-propelled cars of any kind."

Movement of Freight by Truck Down 16.34 Per Cent in July

Movement of freight by motor truck in July was 3.07 per cent under June and 16.34 per cent below July, 1937, according to the monthly statistics compiled by American Trucking Associations, Inc. The A. T. A. truck loadings index figure, based on the 1936 monthly average as 100, stood at 90.68 for July compared with 91.28 for June and 92.24 for May. Comparable reports were received from 130 motor carriers in 31 states, showing an aggregate volume of 468,142 tons transported in July, as against 482,962 tons in June and 559,516 tons in July, 1937.

In the general merchandise class, package freight, July tonnage was 8.70 per cent under July, 1937, and 1.95 per cent under June, 1938. While the movement of petroleum and products in July showed a 2.89 per cent decrease under the corresponding month last year, the volume reported was only .27 per cent under June, 1938, and 25.21 per cent greater than the 1936 monthly average figure. Iron and steel showed a 59.20 per cent decrease under July of last year, but a 4.46 per cent increase over June of this year. Movement of cars and trucks by automobile transporters dropped 23.99 per cent under June and 65.71 per cent under July of last year.

Joint Truck-Rail Rates for Trailers

Joint tariffs to cover the movement of trailers on flat cars between Chicago and the Twin Cities are being compiled by the Chicago Great Western and the Central States Motor Freight Bureau, Inc., and when completed will succeed the railroad's tariff which has been in effect since the service was started on July 7, 1936. The Great Western tariff provided for a charge of $42.50 per loaded trailer handled between Chicago and St. Paul on flat cars, with an additional charge of $10 each for loaded trailers exceeding 20,000 lb. The rate for an empty trailer was $21.25. Any trucker could ship trailers under the tariff. Under Ex Parte 123 the rate for a loaded trailer was increased to $46.75, the penalty rate to $11 and the rate for an empty trailer to $23.38.

On June 25, 1937, a joint tariff was issued providing through truck-rail class rates and was supplemented on December 24, 1937, with through commodity rates. Efforts are now being made to issue a new joint truck-rail tariff to cover the through movement of dairy products, and when it is adopted the Great Western's tariff will be withdrawn. Under the joint tariffs the $46.75, the $11, and the $23.38 become the railroad's division of the joint truck-rail rates.

During June, 66 empty and 412 loaded trailers were handled, the revenue being $23,081. In July, 126 empty and 432 loaded trailers produced a revenue of $25,764.

Booklet Features Grand Central Zone

Grand Central terminal, the main passenger station in New York City of the New York Central and the New York, New Haven & Hartford, and the 48 acres surrounding it known as the Grand Central Zone, are described in a 36-page, 9-in. by 12-in. book entitled "The Gateway to a Continent," published by the New York Central in the interest of the railroads and the many apartments, office buildings and hotels which are situated in the "air rights" area over the terminal tracks. Referred to popularly as New York's "City within a City," the Grand Central Zone, besides containing the railroad terminal proper, through which some 31,000,000 Central and New Haven passengers pass annually, is an integrated business, recreational, hotel and residential center, housing eight important hotels, 11 large office buildings furnishing facilities for 20,000 persons, a group of smart resident apartments and rows of shops.

It is the purpose of the book to describe the facilities enumerated above and to show briefly the development of the area from a site given over exclusively to terminal and yard facilities for steam railroad operation to a civic center of note, built over electrified terminal trackage. Large colored prints depict the major buildings in the area, while brief captions accompanying each describe the facilities offered in each. A colored sketch map in large scale presents a bird's-eye view of the district and its relation to local transit routes, while a cross-sectional diagram of the railroad terminal proper shows the complicated underground trackage and arrangement of the waiting rooms, concourses, ramps, etc., built above.

Colorado Convicted of Tax-Gouging

United States District Judge J. Foster Symes on August 19 signed "findings of fact and conclusions of law" holding that Colorado for at least five years has been discriminating against the railroads in favor of other property owners. The "findings of fact," in the cases of the Union Pacific, the Chicago, Burlington & Quincy, the Atchison, Topeka & Santa Fe, the Colorado & Southern and the Denver & Salt Lake, which sought relief from tax increases resulting from a 20 per cent increase in valuation made by the state board of equalization last fall, state that:

"For the last five years the property of the railroads as a class has been intentionally, systematically, continuously and arbitrarily assessed for purposes of taxation in excess of its full, true and cash value while during this period taxable property in said state other than railroad property has been assessed for purposes of taxation by the taxing authorities at 70 per cent and less of its true and full cash value. Said practice of valuation and assessment has been carried on systematically and intentionally for the purpose and with the effect of compelling the railroads in Colorado to pay more and bear more than their just and proper share of the tax burden of the state."

Judge Symes held that full, true and cash value of the railroads for 1937 did not exceed the value placed thereon by the Colorado tax commission. It was this valuation which the board of equalization, composed of the governor and other elective state officers, increased 20 per cent.

Buses for N. Y. S. & W.?

A tentative plan for a direct connecting service by motor bus into the heart of mid-town Manhattan, New York, has been announced by W. Kidde, trustee for the New York, Susquehanna & Western, which at present operates suburban passenger trains between Butler, N. J., and Erie terminal, Jersey City, N. J., with ferry connections to Manhattan. The road would stop its trains at North Bergen, N. J., about three miles west of the Hudson river, where passengers would transfer directly to and from buses operating to Times Square and the mid-town section of Manhattan via Union City, N. J., and the recently-opened Lincoln vehicular tunnel under the Hudson river. While the connecting highway service would probably be operated by an independent company under contract, a joint fare and single ticketing would be offered to all passengers.

By reason of the co-ordinated service, passengers would be carried directly to the center of the metropolis, and avoid the present circuitous route via the Erie station and ferries or the Hudson & Manhattan "tubes," which more properly serve commuters having destinations in lower Manhattan.

The railroad also promulgated a plan last spring providing for the withdrawal of certain trains between North Hawthorne, N. J., and Butler and substitution of co-ordinated bus service therefor. Permission for the intrastate operation has been granted by the New Jersey Board of Public Utility Commissioners. Hearings on the application for certificates under the Motor Carrier Act for both bus services are scheduled for September 6 before joint board No. 3 of the Interstate

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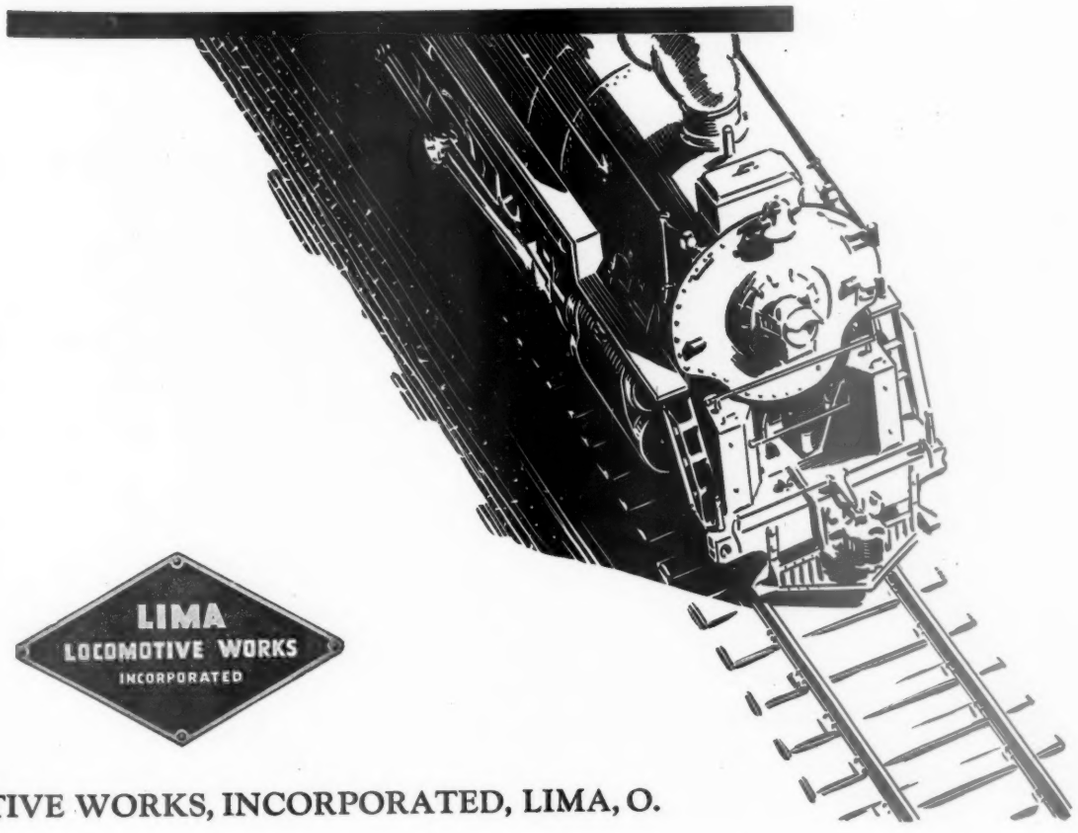
SPEED FLEXIBILITY LOW COST OPERATION

In the steam locomotive these three necessities of modern railroading have reached their highest stage of development.

The streamlined Super-Power steam locomotive is capable of providing the highest speed you can use, the greatest hauling capacity and the lowest operating cost with the greatest safety.



LIMA LOCOMOTIVE WORKS INCORPORATED

LIMA LOCOMOTIVE WORKS, INCORPORATED, LIMA, O.

Commerce Commission, at the Hotel New Yorker, New York.

Equipment on Order

Class I railroads on August 1 had more new freight cars on order than at any time so far this year, according to the Association of American Railroads. The August 1 total was 10,234 compared with 5,021 on July 1 and 38,089 on August 1, last year; on August 1, 1936 there were 27,151.

New steam locomotives on order August 1 totaled 26, compared with 37 on July 1, and 283 on August 1, 1937. New steam locomotives on order on August 1, 1936, totaled 65. New electric and Diesel-electric locomotives on order on August 1, totaled 23 compared with 26 on July 1, and 29 on August 1, 1937; two years ago there were 20 on order.

Class I railroads in the first seven months this year installed 6,927 new freight cars. In the same period last year, 41,630 were put in service, and in the same period two years ago, the number was 14,914. New steam locomotives put in service in the seven months' period this year totaled 136, compared with 198 in the corresponding period last year, and 26 in the corresponding period two years ago. New electric and Diesel-electric locomotives installed in the first seven months of 1938 totaled 82, compared with 25 last year and 14 two years ago.

New freight cars and locomotives leased or otherwise acquired are not included in the above figures.

Southeastern Roads Propose Port Zone Plan

A tentative plan for the equalization of import, export and Panama canal rates applying between points in the Southeast and Gulf, south Atlantic and Virginia ports has been prepared by the Southern Freight Association to be used as the basis of discussion at a meeting between traffic men of the Southeastern carriers and representatives of 11 ports between Norfolk, Va., and New Orleans, La., originally scheduled for August 16 and later postponed to September 20, in Atlanta, Ga.

J. G. Kerr, chairman, Southern Freight Association, in a letter suggesting the meeting, states that "for several years past the carriers have received complaints regarding the rates to or from one port versus another" and that these, together with the disturbances in relationships as between the ports occasioned by the increases under Ex Parte 123, as well as other considerations, have led the roads to consider the adoption of a plan for relating the rates as between the several ports applicable on export and import traffic and on shipments moving via the Panama canal.

He therefore asks that the port representatives examine the tentative plan prepared and meet to discuss the matter with representatives of the chief traffic officers of the port railroads.

Briefly, the plan provides that Southeastern territory be divided into zones determined by their distance to two port groups,—the South Atlantic coast and the Gulf coast. Each group would have key ports to which would be related "outlying" ports in the same group. These key ports would themselves be related by the creation of certain "parity" and non-parity zones. Inland points located in the former would enjoy the same rates to and from the key port on the south Atlantic coast and the key port on the Gulf coast, while points located east of the "parity" zone would have lower rates to and from the south Atlantic key port than the Gulf Coast key port, and points located west of the "parity" zone would be given lower rates to and from the Gulf coast key port than the south Atlantic key port.

Freight Car Loading

Loading of revenue freight for the week ended August 13 totaled 589,561 cars, an increase of 5,511 cars or 0.9 per cent above the preceding week, but a decrease of 184,221 cars or 23.8 per cent below the corresponding week in 1937 and a decrease of 314,596 cars or 34.8 per cent below the same week in 1930. All commodity classifications except grain and coke showed increases over the preceding week, while all commodity classifications except grain showed decreases under last year. The summary, as compiled by the Car Service Division, Association of American Railroads, follows:

Revenue Freight Car Loading

For Week Ended Saturday, August 13

Districts	1938	1937	1936
Eastern	114,223	151,966	147,375
Allegheny	104,623	156,491	148,439
Pocahontas	42,642	51,710	51,865
Southern	88,259	98,288	98,250
Northwestern	93,110	136,307	124,432
Central Western	101,700	120,650	108,846
Southwestern	45,004	58,370	57,371
Total Western Districts	239,814	315,327	290,649
Total All Roads	589,561	773,782	736,578
Commodities			
Grain and Grain Products	47,896	42,982	42,756
Live Stock	11,945	14,579	15,247
Coal	91,517	116,325	117,033
Coke	4,228	9,676	8,365
Forest Products	29,724	40,749	36,561
Ore	24,798	74,488	56,132
Merchandise l.c.l.	148,536	166,682	165,345
Miscellaneous	230,917	308,301	295,139
August 13	589,561	773,782	736,578
August 6	584,050	766,182	728,371
July 30	588,703	779,091	747,529
July 23	580,882	767,470	730,981
July 16	602,300	766,384	720,359
Cumulative Total, 32 Weeks	17,676,811	23,572,042	21,087,756

In Canada.—Car loadings for the week ended August 13 totaled 43,569, as compared with 40,306 in the preceding week and 51,006 a year ago, according to the compilation of the Dominion Bureau of Statistics.

Total for Canada:	Total Cars Loaded	Total Cars Rec'd from Connections
Aug. 13, 1938	43,569	17,014
Aug. 6, 1938	40,306	19,631
July 30, 1938	43,838	18,572
Aug. 14, 1937	51,006	22,771
Cumulative Totals for Canada:		
Aug. 13, 1938	1,395,462	654,373
Aug. 14, 1937	1,534,289	866,992
Aug. 8, 1936	1,399,619	741,983

Plan for Merger of G. M. & N. and M. & O. Nears Completion

A tentative plan of consolidation of the Mobile & Ohio and the Gulf, Mobile & Northern has received the approval of all the principal interests involved and it is expected that it will be filed with the Interstate Commerce Commission within the next couple of months for that body's approval. The plan will be particularly beneficial to the Southern which controls the M. & O. and to the Chicago, Burlington & Quincy which owns 27 per cent of the common and preferred stocks of the G. M. & N.

The Southern will be benefited by divesting itself of some $7,295,000 of M. & O. debt with annual interest requirements of $291,800 and it is thought that it will probably be able to get the new consolidated company to take over the obligation to pay $226,008 in dividends on the Mobile & Ohio stock certificates which it now guarantees.

Large bondholders and the bondholders committee of the Mobile & Ohio, the Southern, the Burlington, Reconstruction Finance Corporation and the management of the Gulf, Mobile & Northern have reached a general agreement on the merger plan.

The capital structure of the proposed new consolidated company, which will probably be called the Gulf, Mobile & Ohio would provide for the treatment of existing securities along the following lines:

Equipment trust certificates of both companies would remain undisturbed, with around $3,000,000 outstanding. Gulf, Mobile & Northern first mortgage 5½s and 5s totaling $3,999,000 and $5,987,000 respectively, would be left undisturbed. G. M. & N. secured three per cent serial notes, due January 1, 1939, through January 1, 1945, would also be undisturbed with about $640,000 outstanding.

G. M. & N. preferred would receive a new preferred stock and some common stock to pay for accumulated dividends of around $60 a share. G. M. & N. common stock would not be disturbed.

A new first mortgage bond would be created with a first lien on the entire M. & O. property and a second lien on the G. M. & N., junior only to the Gulf first mortgage bonds. The new company would sell some of these bonds to the RFC and turn the proceeds over to the Southern in payment for $7,839,000 of M. & O. 4s. The latter bonds are pledged under the Southern Railway-Mobile & Ohio collateral 4s which will mature September 1, and of which there are $7,295,000 outstanding.

M. & O. refunding and improvement 4½s would receive 30 per cent in new first 4s; 35 per cent in new income 4½s; fractionally more than six shares of new preferred and 16 shares of common stock; $13,879,000 of this issue is outstanding. M. & O. secured 5s would receive one-fifth more than the refunding and improvement 4½s; $5,000,000 of this issue is outstanding. Montgomery division first 5s would receive par for par in income mortgage bonds, outstanding in the amount of $4,000,000. New Orleans Great Northern income mortgage 5s would receive new preferred and new common stock.

The merger plan also contemplates the establishment of a capital fund and a sinking fund, with the deductions from earnings coming after provision for the interest on the first mortgage bonds but before the interest on the income bonds.

It is understood that an agreement has

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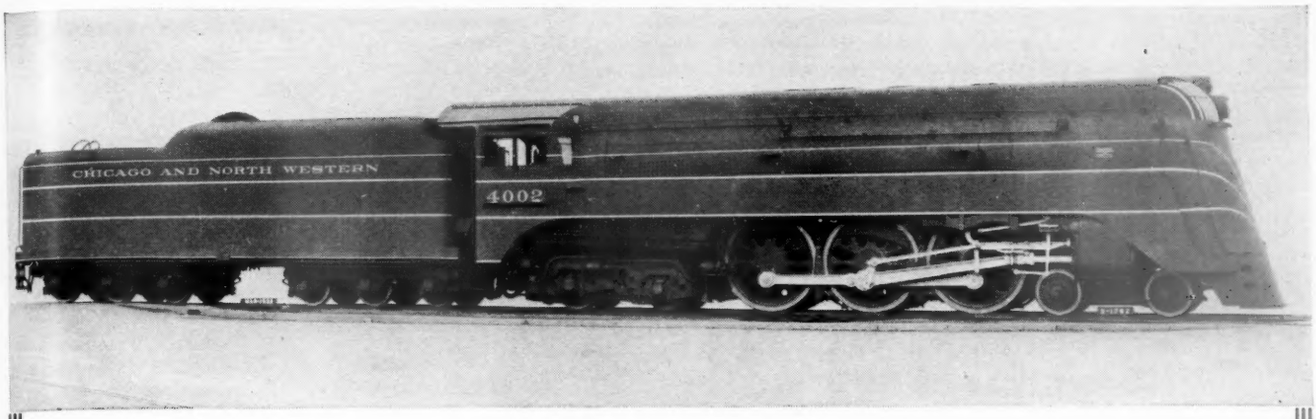
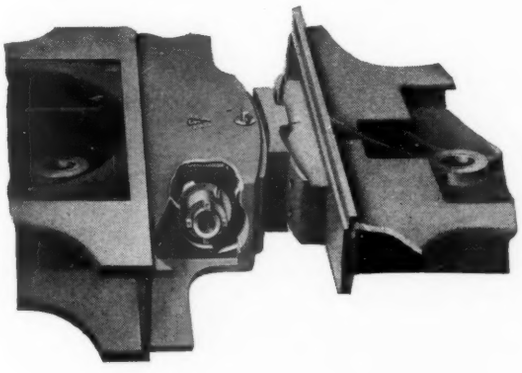


EASY RIDING

with the E-2 Buffer on new Chicago and North Western

STREAMLINERS

The nine new streamlined locomotives for the Chicago and North Western are equipped with Franklin E-2 Radial Buffers, the most efficient and the best economy-producing arrangement ever devised for maintaining proper adjustment between engine and tender units. The fine service performance these locomotives are giving fully justifies the incorporation of this buffer in the design.



FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK CHICAGO MONTREAL

been reached with the labor groups on both roads. The plan provides that employees laid off because of the consolidation would receive a lump sum payment of 60 per cent of their previous year's earnings. It is planned to lay off labor only where such action is absolutely necessary, with the roads depending upon normal labor attrition to gradually reduce the number of employees.

It is expected that eventually the consolidation would result in reduced expenses of between $1,500,000 and $2,000,000 a year.

F. D. R. Calls Seaway Enemies "Prophets of Trouble"

Attaching the epithet of "prophets of trouble" to those who oppose the St. Lawrence "Seaway" on the grounds that it will make undue inroads on railroad traffic, President Roosevelt categorically denied that the proposed waterway "will handicap our railroad systems," in a speech delivered at the opening ceremonies of the Thousand Islands international bridge on August 18. Standing at the Canadian-United States boundary of the new bridge, the President spoke in general terms of the possibilities of developing the St. Lawrence river through co-operation by the two countries and declared himself in favor of creating a 27- or 30-ft. channel from the Great Lakes through to the Atlantic by which "every city on the Great Lakes, now inland, would become an ocean port."

Discussing specifically the effect of the waterway on the railroads, Mr. Roosevelt stated:

"I am very clear that prophets of trouble are wrong when they express the fear that the St. Lawrence waterway will handicap our railroad systems. We know now that the effect of a waterway is not to take traffic away from railroad lines. Actually, it creates new possibilities, new businesses, new activity. Such a waterway generates more railroad traffic than it takes away."

I. C. C. Brings C. & L. E. Under Pension Laws

The Interstate Commerce Commission, Division 3, has found that the Cincinnati & Lake Erie does not fall within the exemption proviso in the first paragraph of section 1 of the Railroad Retirement Act and the Carriers Taxing Act, being "more than a street, interurban or suburban electric railway"; and "part of the general steam-railroad system of transportation." Commissioner McManamy wrote the majority report, which discussed C. & L. E. operations and several decisions as to its status, including one (154 I. C. C. 603) wherein the Commission's Division 4 found in 1929 that lines subsequently merged to form the C. & L. E. were street, suburban and interurban electric railways falling within Interstate Commerce Act exemption provisions.

Out of deference to this latter decision and to findings of the Public Utilities Commission of Ohio, the courts of that state and the United States District Court, Commissioner Porter was "impelled to dissent." Also, Mr. Porter was persuaded that the Cincinnati & Lake Erie Property and the method of operating it "fail to meet the test" applied in cases cited by the majority.

The proceeding (Electric Railway Docket No. 3) was instituted at the request of the Railroad Retirement Board and the Commissioner of Internal Revenue. The findings of the majority follow the recommendations of Examiner W. J. Harris' proposed report, as noted in the *Railway Age* of May 14.

This Canadian National Crew and No. 6402 Participated in the Run of President Roosevelt's Special Train From Niagara Falls, Ont., to Kingston, Where He Received a Degree From Queen's University, Prior to Opening the Thousand Islands Bridge

"Olympian" Wreck Ascribed to Piers

(Continued from page 328)

which prevailed generally throughout the territory involved. The speed recorder tape removed from the locomotive after the accident showed that the train was traveling at a speed of about 51 m.p.h. at the time it was derailed.

It was the consensus that the bridge was still intact when the Olympian approached it, in spite of the fact that the upstream ends of Piers 2 and 3 were obviously undermined as the result of the scouring action of the rapid current in the creek, and that the bridge collapsed under the weight of the train. Piers 2 and 3, according to witnesses, obviously tipped upstream about the time the locomotive reached Pier 2, carrying with them the locomotive and the concrete slab spans immediately ahead.

Custer creek drains an area of approximately 160 square miles, but is practically dry about nine months of the year. Between 4 p. m. and 10 p. m. on June 18, three heavy rains, one of cloudburst proportions, occurred over an area of the creek water shed several miles distant from the railroad, imposing upon the main body of the creek and its tributaries the largest volume of water in the last 25 or 30 years, the normal heavy run-off of these storms being supplemented by the waters of several reservoirs upstream, released as the result of dam failures. The indications were that the depth of the water at the bridge reached a maximum of 20 ft., just below the lowest steelwork, whereas the maximum depth of water ever observed in the creek prior to the accident was variously reported to be from three to five feet.

Prior to the accident, a train order had been issued containing the information that heavy rains were reported in certain territories east of the bridge, and that section men were patrolling the track in these territories. It was brought out that the track foreman on the section including the destroyed bridge, in making an inspection of the east end of his section, several miles east of the bridge, continued westward over the bridge to a point beyond Saugus. When returning, he stopped at the bridge, about 10:20 p. m., and made a general inspection of it from its east abutment, at which time he noted that the water in the stream had risen to a height of about six or seven feet, but not sufficiently to cause any alarm. After having notified the dispatcher of the condition in the creek and at other points on his territory, the foreman gave no further attention to the matter. The last train to move over the bridge was No. 263, at 10:15 p. m., about 20 minutes prior to the inspection made by the foreman, and the train crew reported that at that time the water in the creek was about 3 to 4 ft. deep. At the time of the accident, at 12:35 a. m., according to all indications, the water was approximately 20 ft. deep.

According to the report, the channel opening afforded by the bridge was sufficient for even the abnormal volume of water in the creek at the time of the acci-

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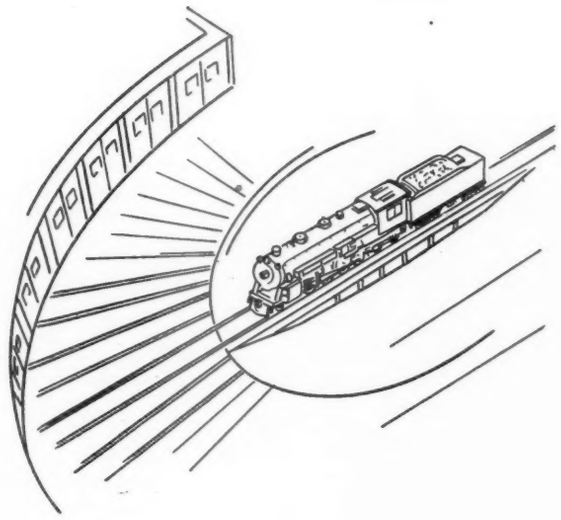
BE SURE
No Arch Brick
Is Missing



There's More to SECURITY ARCHES *Than Just Brick*

In these days of rigid economy, don't draw the line too fine and let a locomotive leave the roundhouse with an imperfect Arch due to lack of supplies.

A single missing Arch Brick has a mighty serious effect on steaming and on the efficiency of the locomotive.

Today, a dollar's worth of fuel means more than ever before. To spend it effectively, every Locomotive Arch should be maintained in perfect condition.

Be sure your stocks on hand are ample to provide fully for all locomotive requirements, so that locomotive efficiency will not suffer.

HARBISON-WALKER REFRACTORIES CO.

Refractory Specialists

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Locomotive Combustion Specialists

dent, and the bridge structure itself was entirely adequate as to design for the traffic it was required to carry. On the other hand, it stated that since the rip-rap had been displaced and the footings of the piers scoured to such an extent that the piers were moved from their normal locations, it is evident that the footings did not extend far enough below the stream bed to insure their stability under a volume of rapidly moving water as great as that which occurred at the time of the accident.

R. R.s Would Keep Coal Rate Boost

(*Continued from page 329*)

months of 1938 the Class I railroads of the United States had a net railway operating income of only $45,288,499, as compared with $240,111,982, for the same months in 1937, a decrease of 81.1 per cent as compared with the latter period. The rate of return on property investment was only 0.54 per cent as compared with 2.85 per cent for the first five months of 1937. The rate of return for the first five months of 1938 was less than for any similar period since 1900, not even excluding the worst depression year of 1932. For the same period the gross revenues derived by the Class I railroads from the increases in the rates on bituminous coal authorized herein are estimated by petitioners as $7,708,552, amounting to over 17 per cent of their total net railway operating income for the same period.

"The net railway operating income of the Eastern carriers (excluding Pocahontas region) for the first five months of 1938 was only $19,236,853, as contrasted with $122,208,879 for the first five months of 1937, a decrease of 84.3 per cent. Twenty-three of the Class I carriers in the eastern district failed to earn operating expenses and taxes during the first five months of 1938. The gross revenues of the Class I railways in the Eastern district (excluding Pocahontas region) from bituminous coal for the first five months of 1938, amounted to $86,458,280 as compared with $131,485,065 for the same five months of the year 1937, a decrease of 34.2 per cent. During the first five months of 1938, petitioners estimate that the amount of gross revenue on bituminous coal of these carriers derived from the increases authorized herein amounted to $3,703,291, or over 19.2 per cent of their total net railway operating income for that period.

"The continuance beyond December 31, 1938, of the increases on bituminous coal authorized herein therefore assumes an even greater importance to those lines than ever before and, petitioners believe, is absolutely necessary in order to enable them to continue to render adequate and efficient railway transportation service.

"For the first five months of 1938 the net railway operating income of the Pocahontas lines was only $15,145,514, as contrasted with $34,759,496, for the first five months of 1937, a decrease of 56.4 per cent. The rates of return of these carriers on property investment for the two periods were 3.24 per cent and 7.53 per cent, respectively. Due to the continuance of the present marked recession in industrial activity, the revenues of the Pocahontas lines from bituminous coal have fallen off to an extraordinary degree. It is no exaggeration to say that the financial results of operation of these lines for the first five months of 1938 are actually and relatively worse than for any comparable period in the last fifteen years.

"The net railway operating income of the Class I railroads in the Southern district (excluding Pocahontas region) for the first five months of 1938 was only $18,573,385, as compared with $36,075,450 for the first five months of 1937, a decrease of 48.5 per cent. Ten of the twenty-seven Class I railroads in the Southern district failed to earn any net railway operating income during the first five months of 1938. For that period the gross revenues derived by all Class I railroads in the Southern district (excluding the Pocahontas lines) from the increases in the rates on bituminous coal authorized herein are estimated by petitioners as $1,009,204.

"The Class I railroads of the Western district failed by $7,667,249 to have any net railway operating income from their operations during the first five months of 1938, as contrasted with a net railway operating income of $47,068,160 for the corresponding period of 1937. All but twenty-one of the fifty-one Western roads operated at a deficit during the first five months of 1938. Petitioners estimate that the increases in the rates on bituminous coal authorized herein yielded increased revenues to the Western lines of $1,159,115 during that period, without which their deficit would have been correspondingly increased.

"The vital importance to the Southern and Western roads of these increases in their rates on bituminous coal is obvious. The injustice of depriving those carriers of said increases merely because of circumstances that relate entirely to the Pocahontas lines is also obvious when it is considered that most of the Western and many of the Southern roads do not participate at all, or only to a negligible extent, in the bituminous coal traffic which originates on the Pocahontas lines."

Not All Short Hauls Cheaper by Truck

(*Continued from page 330*)

data prepared under different method or form if it so desired." None of carriers did the latter, and a G. S. & I. witness expressed the opinion that the results obtained "were as near an approximation of the cost of handling naval stores as it was possible to secure." A G. M. & N. witness testified that the data submitted were compiled in accordance with instructions, adding that "he had not had an opportunity to analyze the methods used for determining costs so as to state whether he agreed or disagreed with them." None of the witnesses for the Evans Line "expressed any objection to, or disagreement with the cost-finding methods prescribed." Both of the rail carriers, however, questioned including the item of return on investment, but for reasons which were "not conclusive" to the examiner.

In his discussion of the Bureau of Statistics formulae and their application to the rail and truck movements involved, the examiner addresses himself to this contention of the railways that they cannot be expected to fix their competitive rates upon the basis of a uniform return on property values. He thought it should be apparent that "for any particular commodity movement shared with competitive agencies, at least one of those agencies should earn its full operating expenses, taxes, and a fair return upon its investment. We cannot determine whether that condition exists without considering a return on investment in the costs of each of the carriers."

The discussion of the truck operating practices brought out that drivers are paid on a round-trip basis—"$1.50 for each round trip from Gulfport to Hattiesburg, which requires about 7½ to 8 hours time; and $2.00 from Gulfport to Columbia of Laurel, both of which require about 9 hours time." Also, the driver "does the loading about two-thirds of the time, and all of the unloading." Before compiling his final cost tabulation the examiner made certain adjustments in the data submitted by the carriers.

In his general remarks he looks over section 15a's stipulation that the commission, among other things, give consideration to the public need for adequate and efficient rail service and to the Motor Carrier Act's section 202(a) which outlines the policy of Congress to recognize and preserve the "inherent advantages" of motor transportation. He finds that the foregoing provisions "are not inconsistent"—they lay upon the commission "the paramount duty" to regulate both agencies, "not in the interest of one or the other of such agencies, but in the public interest."

"Healthy competition between different agencies of transportation is undoubtedly in the public interest," Mr. Bardwell goes on. "Ordinarily either may initiate rates that will in the opinion of its management enable it to obtain or retain desired traffic provided that such rates are compensatory and do not cast a burden upon other traffic. Such competition results in the furnishing of adequate transportation at low cost. But when, because of an insufficient volume of traffic or for any other reason competition is carried to the point where the service is being performed at a loss, that is against public interest. Such competition tends to undermine the financial stability of the carriers and thereby to lessen their ability to furnish adequate and efficient service. It is to prevent such cutthroat competition that the commission has been given the power to prescribe reasonable minimum rates. This power has been used sparingly. Often when its use might have been desirable, the commission was without sufficient knowledge of transportation costs to permit of its application with certainty. In the instant proceedings the record contains cost data covering the more important movements, which have been carefully compiled and whose validity has not been seriously questioned."

Continued on next left-hand page

Features

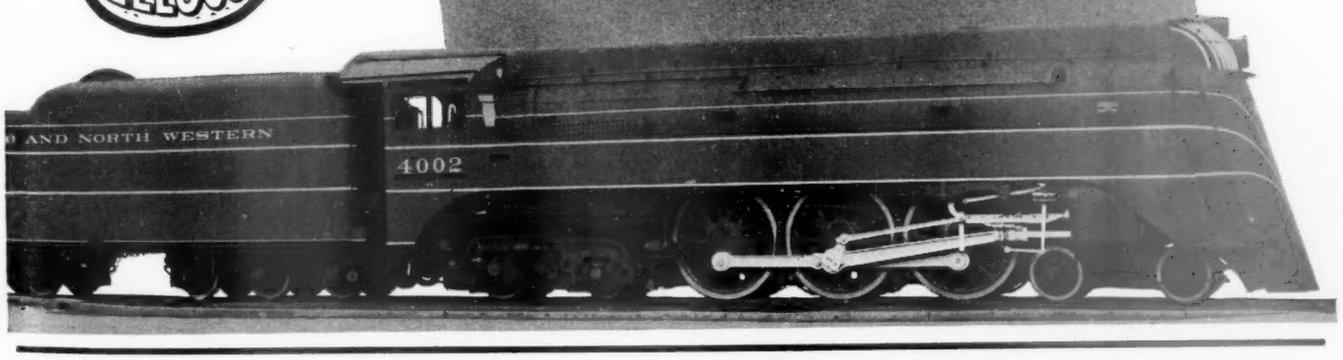
on All of the 9 New C.&N.W. Locomotives

Elesco

Type "E" Superheaters
Exhaust Steam Injectors
Tangential Steam Dryers
Pyrometers

American

Multiple-Valve Throttles



THE SUPERHEATER COMPANY

Representative of AMERICAN THROTTLE COMPANY, INC.
60 East 42nd Street, NEW YORK 122 S. Michigan Ave., CHICAGO
Canada: THE SUPERHEATER COMPANY, LTD., MONTREAL

A-1250

Superheaters « Exhaust Steam Injectors « Feed Water Heaters « American Throttles « Pyrometers « Steam Dryers

Construction

AMERICAN REFRIGERATOR TRANSIT CO.—This company, which is jointly owned by the Missouri Pacific and the Wabash, in connection with extensive improvements to its car shops in St. Louis, Mo., has awarded a contract to the Woermann Construction Company, St. Louis, for the erection of a one-story brick office, wash and locker building, 38 ft. by 60 ft.; a car repair shed, 92 ft. by 430 ft.; a mill shop, 59 ft. by 186 ft.; a compressor building, 26 ft. by 55 ft.; a welding shop, 25 ft. by 55 ft.; a paint storage building, 25 ft. by 125 ft.; and the relocation on a new concrete foundation of an existing 15-ft. by 40-ft. waste renovating building. All of the new structures, except the office building, will be of structural steel frame construction with corrugated asbestos roofing and siding. The contract for the electrical work, including the lighting and the power distribution system for the new shops has been awarded the Briner Electric Company, St. Louis. The total cost of the new shop building and the machinery for these improvements will be between $200,000 and $300,000.

CHICAGO & NORTH WESTERN.—A contract amounting to approximately $15,000 has been awarded the Drainage Engineering Company, Chicago, for the furnishing and installation at 13 locations of 48-in. and 36-in. corrugated iron culverts on this road.

CHICAGO, BURLINGTON & QUINCY.—Contracts for a grade separation project over the tracks of this railroad at Ogden Ave. (U. S. Highway No. 34) and Cicero Ave. (Highway No. 50) in Cicero, Ill., have been let by the State of Illinois, Division of Highways, as follows: Thos. McQueen, Forest Park, Ill., $71,424 for the approaches; Superior Concrete Construction Co., Chicago, $93,431 for the construction of the reinforced concrete floor, handrail, etc.; Strobel Construction Co., Chicago, $80,994 for the erection of the structural steel for the truss and I-beam superstructure; American Bridge Co., Chicago, $253,880 for the fabrication and delivery of the structural steel; Kil-Bar Electric Co., Chicago, $18,950 for the furnishing and installation of the lighting system in the bridge and approaches, and H. Knudson Co., Chicago, $9,000 for furnishing and applying field paint. The entire structure will consist of spans of the following lengths: two 233-ft., one 172-ft., one 130-ft., one 125-ft., two 60-ft., two 58-ft., two 55-ft., two 50-ft., two 46-ft. and two 44-ft. spans.

CHICAGO, ROCK ISLAND & PACIFIC and the CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—The Iowa State Highway Department has awarded a contract to the Massman Construction Company, Kansas City, Mo., for the construction of a subway which will carry the tracks of these roads over North Second avenue in Washington, Iowa. The cost of the project will be approximately $150,000.

ILLINOIS CENTRAL.—Contracts for the construction of a grade separation bridge at Tuscola, Ill., which will carry the tracks of this railroad over U. S. Highways No. 36 and No. 45, have been awarded by the State of Illinois, Division of Highways, as follows: to the Hansell-Elcock Co., Chicago, $7,737 for the fabrication and delivery of the structural steel, and to the F. D. Birt Construction Co., Decatur, Ill., $38,332 for the construction of the reinforced concrete substructure and the erection of the structural steel.

LONG ISLAND.—Contract has been given to Tully & DiNapoli, Long Island City, N. Y., for the construction of a steel and reinforced concrete overhead highway bridge at Eliot avenue, Freshpond, Borough of Queens, New York.

Equipment and Supplies

LOCOMOTIVES

THE FERROCARILL DE ANTIOQUIA is inquiring for two locomotives of the 2-8-2 type. Pablo Rodriguez is purchasing agent at Medellin, Colombia, South America.

FREIGHT CARS

THE BESSEMER & LAKE ERIE has entered into a contract with the Pullman-Standard Car Manufacturing Company for the leasing of 100 light-weight, all welded, steel box cars of 50 tons' capacity, with an option to buy.

IRON AND STEEL

LONG ISLAND.—A contract for 150 tons of structural steel has been given to the American Bridge Company for an overhead bridge at Eliot avenue, Freshpond, New York. Tully & DiNapoli, Long Island City, N. Y., have the general contract.

SIGNALING

ILLINOIS CENTRAL.—Sealed proposals will be received at the office of the signal engineer, Illinois Central, Chicago, until 1:00 p. m. (c.s.t.) September 12, for the furnishing of signal materials to be used in connection with 12 federal aid grade crossing protection projects in the State of Illinois. H. G. Morgan, signal engineer, 135 E. Eleventh place, Chicago.

CHICAGO & NORTH WESTERN.—Sealed proposals will be received by this road, Chicago, until 1:00 p. m. (c.s.t.) September 13, for furnishing the materials for six railroad grade crossing flashing light signal installations, to be installed under the federal grade crossing program in the State of Illinois. C. T. Dyke, vice-president and chief engineer, Chicago.

MOTOR VEHICLES

THE SOUTHEASTERN GREYHOUND LINES has ordered from the American Car & Foundry Motors Company three motor coaches powered with Hall-Scott horizontal engines.

Supply Trade

Roy H. Sjoberg has been appointed sales representative in the New York district of the **J. G. Brill Company** reporting to **L. H. Corlette,** district sales manager, 30 Church street, New York. Mr. Sjoberg has had extensive sales and engineering experience in the transportation field with one of the large electrical equipment manufacturing companies.

J. C. Barnaby, manager of the **Worthington Pump & Machinery Corporation's** Oil and Gas Engine Application division, at Buffalo, N. Y., and responsible for engine sales in the Central division, has been placed in charge of special engineering work covering engine research and design. **W. E. Wechter,** in charge at New York of engine sales in the Atlantic division, has been transferred to Buffalo to succeed Mr. Barnaby, and he will be assisted by **J. F. Hecking,** assistant manager of the Oil and Gas Engine Application division. The Atlantic division, oil engine sales will be covered by **H. C. Wood** at New York, while **W. L. Russell,** at Harrison, N. J., will take over the gas engine sales, in addition to Mr. Russell's present responsibilities as manager of the Eastern division of Worthington Oil and Gas Power Sales.

TRADE PUBLICATION

WELDING ALUMINUM.—A 48-page, illustrated revision of "Welding Aluminum and Its Alloys" has been issued by the Aluminum Company of America, Pittsburgh, Pa. The sections of the booklet cover fusion welding, welded aluminum vessels, torch welding, heat-treated aluminum alloys, welding castings, arc welding and resistance welding.

Financial

CENTRAL GREYHOUND LINES.—*Preferred Stock.*—This New York Central affiliate has asked the Interstate Commerce Commission for authority to issue 9,500 shares of preferred stock to repay advances made by the Greyhound Corporation.

ERIE.—*Loan Payment.*—Trustees of the Erie filed a petition in the federal district court at Cleveland, Ohio, on August 18 asking for permission to make partial payments on past due loan installments to the Reconstruction Finance Corporation. If the payments are permitted, it was said that the R. F. C. will wait 90 days before taking any action toward terminating leases on property covered or moving up the maturity dates of certificates. The trustees asked to be allowed to pay $350,000 before August 25 and another $153,000 before September 25 on a principal payment of $503,000 which became due last March 1. The maturity was part of an $11,833,000 issue of trust certificates issued under

Continued on next left-hand page

NINE new streamlined locomotives of the 4-6-4 type have been completed for the Chicago and North Western. These locomotives have been assigned to the North Western passenger service between Chicago and Omaha where they haul some of the well-known trains including the "Challenger", the "Overland Limited", the "Los Angeles Limited", the "Pacific Limited", and the "Forty-Niner" which consists entirely of Pullman cars.

The new streamlined locomotives, attractively sheathed and painted to harmonize with the new cars also operating in this service, develop maximum possible power obtainable with three driving axles.

NEW POWER — NEW PROFITS

Weight on Drivers	216,000 pounds	Diameter of Drivers	84 inches
Weight of Engine	412,000 pounds	Boiler Pressure	300 pounds
Cylinders	25 x 29 inches	Tractive Power	55,000 pounds

AMERICAN LOCOMOTIVE COMPANY

50 CHURCH STREET · NEW YORK · N.Y.

the Erie Railroad Equipment Trust of 1934. The certificates were pledged with the RFC as security for a loan to the Erie. Another principal payment of $503,000 and dividends of $226,600 become due September 1.

GAINESVILLE MIDLAND. — *Bonds.* — The Interstate Commerce Commission, Division 4, has authorized this company to procure the authentication and delivery of $78,000 of first mortgage four per cent bonds, to be pledged with the Reconstruction Finance Corporation as collateral security for a loan of a like amount to the company. The bonds will mature January 1, 1978.

LEHIGH VALLEY.—*Pledge of Securities.* —This company has asked the Interstate Commerce Commission for authority to pledge and repledge as collateral security for a promissory note to be issued to the Manufacturers Trust Company of New York City as of October 10 and to mature March 1, 1940, in the sum of $6,175,000 at the rate of three per cent payable in part in minimum monthly installments of $41,666.66 commencing November 1, and the remainder payable on the maturity date of the note, March 1, 1940, all or any part of $14,000,000 of Lehigh Valley general consolidated mortgage five per cent bonds, due 2003; $1,000,000 of Lehigh Valley general consolidated mortgage 4½ per cent bonds, due 2003; $5,000,000 of Lehigh-Buffalo Terminal 4½ per cent first mortgage bonds, due 1966; $1,000,000 of Lehigh Valley Coal Company six per cent secured notes, due January 1, 1943 and guaranteed by the Lehigh Valley. The company will also pledge 1,250 shares of capital stock of the Buffalo Creek; 8,000 shares of common stock of the Ironton and 1,000 shares of Lehigh Valley Harbor Terminal common stock.

LEHIGH VALLEY.—*Plan for Interest Extension.*—The board of directors of this company has approved a tentative plan of interest deferment which, it is estimated, will give the road the use of $1,181,000 additional cash on November 1, 1938, and $2,362,000 in each of the years of 1939 and 1940. The plan provides for the extension of the following subsidiary mortgages for ten years from maturity: (1) Pennsylvania & New York Canal & Railroad Co., $8,500,000, matures April 1, 1949; (2) The Lehigh Valley Rail Way Co. 4½ per cent, $15,000,000, matures July 1, 1940; (3) Lehigh Valley Terminal Railway Co. (now Lehigh Valley Railroad Co. of N. J.), 5 per cent, $10,000,000, matures October 1, 1941.

The plan further provides for the extension of 75 per cent of five interest maturities on the $72,336,000 general consolidated mortgage bonds outstanding for a five-year period commencing November 1, 1938. All bank loans would be extended for five years from approximately November 1, 1938, with approximately 5 per cent of the principal amount of each to be paid off during each year of the extension; 3 per cent interest to be paid. R. F. C. loans would be given substantially the same treatment, although no official action has been taken. A "reasonable" sinking fund would be provided and no stock dividends would be paid until deferred interest installments and bank and R. F. C. loans were paid.

The plan is now under consideration by the S. E. C. and will shortly be laid before the I. C. C. and a bondholders' committee.

NEW YORK, NEW HAVEN & HARTFORD.—*Appointment of Separate Trustees.*—Federal Judge F. J. W. Ford, Boston, Mass., has appointed B. W. Warren and C. W. Mulcahy separate trustees for the Boston & Providence, a leased road. Mr. Warren is president of the B. & P. Railroad Corporation. The judge set October 1 for filing proofs of creditors' claims.

NORFOLK & PORTSMOUTH BELT.—*Notes.* —The Interstate Commerce Commission, Division 4, has authorized this company to issue at par a promissory note or notes for $700,000, the proceeds to be applied to the payment at maturity on October 1, of $450,000 of promissory notes, and to the redemption prior to maturity, of $250,000 of the company's general and refunding mortgage five per cent bonds, series A.

SOUTHERN.—*RFC Loan Approved.*—The Interstate Commerce Commission, Division 4, has approved a loan to this company of $11,795,000 by the Reconstruction Finance Corporation and the extension of the time of payment of a loan of $12,475,204 by the RFC, maturing September 1, 1938, to September 1, 1943. The $11,795,000 loan will mature September 1, 1943, and the proceeds will be used to retire $4,500,000 of Southern Railway-East Tennessee reorganization mortgage 5s and $7,295,000 of Southern Railway-Mobile & Ohio collateral trust 4s, both issues maturing September 1, 1938.

SUSQUEHANNA RIVER & WESTERN.—*Abandonment.*—The Interstate Commerce Commission, Division 4, has dismissed the application of this company for authority to abandon a line extending from New Bloomfield, Pa., to Bloomfield Junction, 2.7 miles. It has been found that the line was abandoned and the track removed in October, 1934.

UNION PACIFIC.—*Abandonment.* — This company has asked the Interstate Commerce Commission for authority to abandon its Grass Creek branch extending from Grass Creek Junction, Utah, to Grass Creek, 5.6 miles, together with 0.4 mile of secondary track.

Average Prices of Stocks and Bonds

	Aug. 23	Last week	Last year
Average price of 20 representative railway stocks..	29.13	28.00	50.21
Average price of 20 representative railway bonds..	60.50	59.88	78.51

Dividends Declared

Beech Creek.—50c, quarterly, payable October 1 to holders of record September 15.

Chesapeake & Ohio.—25c; Preferred, $1.00, quarterly, both payable October 1 to holders of record September 8.

Chestnut Hill.—75c, quarterly, payable September 6 to holders of record August 20.

Erie & Pittsburgh.—87½c, quarterly, payable September 10 to holders of record August 31.

Philadelphia, Germantown & Norristown.—Common, $1.50, quarterly, payable September 6 to holders of record August 20.

Railway Officers

FINANCIAL, LEGAL AND ACCOUNTING

Bruno W. Rose, chief land appraiser of the Illinois Central, with headquarters at Chicago, has been promoted to land and tax commissioner with the same headquarters, succeeding **F. A. Hogberg,** whose death August 13 was reported in the *Railway Age* of August 20.

John W. Freels, local attorney for the Illinois Central in Cook County, Ill., with headquarters at Chicago, has been promoted to general attorney with the same headquarters, and **Herbert J. Deany,** assistant local attorney at that point, succeeds Mr. Freels as local attorney. The position of general solicitor, Southern Lines, left vacant by the recent death of **Charles Newell Burch,** which was reported in the *Railway Age* of July 20, will not be filled. Instead, the jurisdiction of **Vernon W. Foster,** general solicitor of the Northern Lines, with headquarters at Chicago, will be extended to cover the entire system, and **Clinton H. McKay,** general attorney of the Southern Lines, with headquarters at Memphis, Tenn., will have jurisdiction over legal matters in Tennessee, Mississippi and Arkansas.

OPERATING

Effective September 1, **G. B. Daniel,** trainmaster on the Norfolk division of the Virginian, with headquarters at Roanoke, Va., has been transferred in the same capacity to the New River division, with headquarters at Princeton, W. Va. **C. W. Dowdy,** who heretofore served as trainmaster of the New River division at Princeton, has been transferred to the Norfolk division to replace Mr. Daniel.

O. M. Dawson, assistant superintendent on the Pocahontas division of the Norfolk & Western, has been promoted to superintendent of that division, with headquarters at Bluefield, W. Va., succeeding **C. H. Tabor,** who has been transferred to the Scioto division, with headquarters at Portsmouth, Ohio, replacing **D. F. Peters,** whose death July 14 is announced elsewhere in these columns. Mr. Dawson was born at Richlands, Va., on June 3, 1897, and attended Emory and Henry and Roanoke Colleges. He entered railway service in 1911 in the mechanical department of the Norfolk & Western at Bluefield and worked during the summer months between terms of school until 1916, when he left college to become a chainman in the engineering department at Roanoke, Va. In 1917 he resigned to enter military service in the World War, and after the war returned to the Norfolk & Western as a boilermaker at Williamson Shop. In August, 1923, he was appointed assistant roadmaster on the Radford division, and in January, 1927, he was promoted to roadmaster on the Shenandoah division. Two

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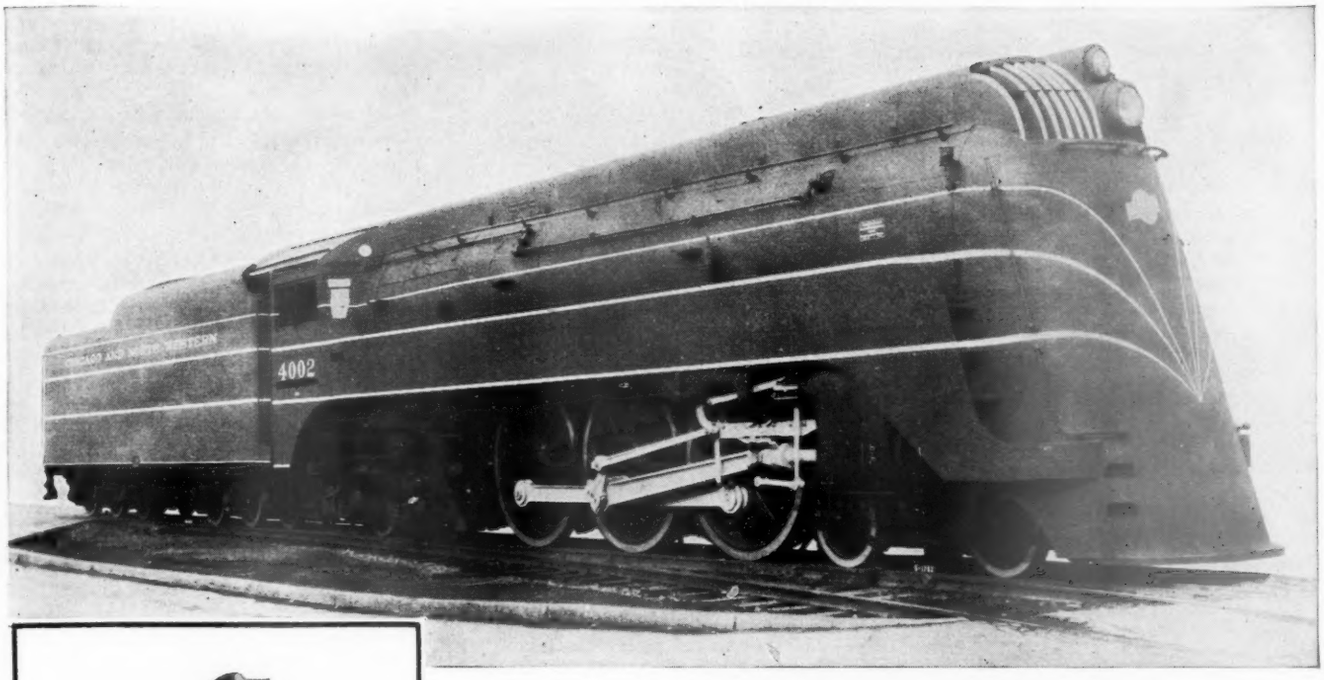
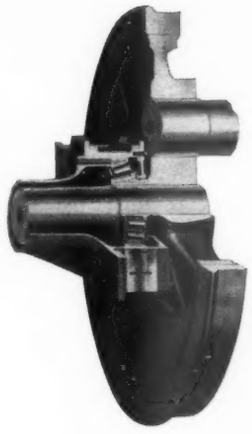
ALL DRIVING AXLES AND TRAILER TRUCKS EQUIPPED WITH TIMKEN BEARINGS





TIMKEN Driving Axle Bearing application as used on the driving axles of these new Chicago and North Western locomotives.

All nine of the new type 4-6-4 high-speed streamlined passenger locomotives built by the American Locomotive Company for the Chicago and North Western Railroad are equipped with TIMKEN Bearings on the driving axles and trailer trucks.

The application of TIMKEN Bearings to modern locomotives is a heavy contribution to trouble-free performance, greater availability, higher permissible speeds, lower maintenance costs, increased draw-bar pull, decreased lubrication requirements and reduced fuel consumption.

Furthermore, shopping periods are extended because they are determined by boiler requirements, etc., rather than repairs to journal bearings and axles.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

Manufacturers of TIMKEN Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; TIMKEN Alloy Steels and Carbon and Alloy Seamless Tubing; TIMKEN Rock Bits; and TIMKEN Fuel Injection Equipment.

TIMKEN
RAILWAY ROLLER BEARINGS

years later Mr. Dawson was advanced to assistant superintendent of that division and was later transferred successively to the Radford, Scioto and Pocahontas divisions.

TRAFFIC

Edward Lind has been appointed district freight agent at Indianapolis, Ind., for the Baltimore & Ohio, succeeding **S. C. Farrington,** resigned, effective August 16.

Kenner S. Boreman, assistant general freight agent of the New York, Chicago & St. Louis, with headquarters at Cleveland, Ohio, has been promoted to general freight agent, with the same headquarters, succeeding **Leo Gallagher,** whose promotion to assistant freight traffic manager at Cleveland, Ohio, was announced in the *Railway Age* of July 30.

Effective September 1, **B. G. Brown,** coal traffic manager of the Southern, with headquarters at Washington, D. C., will retire from the service of that road, after 40 years' of service. The position of coal traffic manager will be abolished and all correspondence respecting coal rate adjustments should be referred to **C. D. Thomas,** assistant freight traffic manager at Atlanta, Ga.

Carl W. Evers, general agent in the freight department, of the Union Pacific, with headquarters at Omaha, Neb., has been promoted to assistant general freight agent, with the same headquarters, succeeding **F. B. Choate,** who has retired. **Joseph C. Beaumont,** general agent at Tulsa, Okla., has been transferred to Omaha to replace Mr. Evers, and **Leon B. Bradley,** traveling freight and passenger agent at Tulsa, has been promoted to general agent of that point relieving Mr. Beaumont.

L. E. Wetterau, assistant traffic manager on the Southern, with headquarters at New Orleans, La., has been promoted, effective September 1, to assistant freight traffic manager, with headquarters at Birmingham, Ala., succeeding **G. H. Wilcox,** who will retire on that date. **E. L. Brown,** eastern freight agent, at New York City, has been promoted to assistant traffic manager, at New Orleans, to replace Mr. Wetterau.

Mr. Wilcox entered the service of the Southern as a commercial agent at Cincinnati, Ohio, in 1907, and was promoted to assistant general freight agent of the Georgia Southern & Florida, with headquarters at Macon, Ga., in November, 1911. On March 1, 1920, he was appointed assistant to the freight traffic manager of the Southern at Washington, D. C., and on November 1, 1922, he was promoted to assistant freight traffic manager with headquarters at Birmingham. On October 14, 1924, Mr. Wilcox was transferred to Atlanta, Ga., and in September, 1930, he was advanced to freight traffic manager at that point. He was later appointed assistant freight traffic manager at Birmingham.

Richard E. Drummy, whose promotion to general passenger agent on the Union Pacific, with headquarters at Los Angeles, Cal., was announced in the *Railway Age* of July 30, was born at Omaha, Neb., on December 1, 1891, and attended Creighton College for two years. He entered railway service in the general passenger office of the Union Pacific at Omaha on March 1, 1910, and on June 15 of that year was transferred to the office of the director of traffic at Chicago.

Richard E. Drummy

In October, 1911, he was transferred to New York when the office of director of traffic was moved to that point. In 1913 he was transferred again to Omaha, and in 1916 he returned to Chicago where he served in the office of the passenger traffic manager. During the war Mr. Drummy was assigned to the U. S. Railroad Administration at Washington, D. C. After the termination of federal control he was appointed traveling freight and passenger agent for the Union Pacific at Minneapolis, Minn., and on June 15, 1923, he was transferred to Fresno, Cal. On October 1, 1927, he was promoted to general agent at Santa Ana, Cal., and subsequently served in that capacity at Riverside, Cal., and Los Angeles. He was general agent at Los Angeles at the time of his recent promotion.

OBITUARY

P. H. Nee, general superintendent of the Chicago, Milwaukee, St. Paul & Pacific with headquarters at Milwaukee, Wis., died at Milwaukee on August 24, following an operation for appendicitis.

Edward T. Miller, former vice-president and general solicitor of the St. Louis-San Francisco, whose death on August 11 was announced in the *Railway Age* of August 20, was born at Keytesville, Mo., on December 29, 1870, and attended Westminister College, Fulton, Mo. In 1903, he engaged in the practice of law with the firm of Boyle, Priest & Lehmann at St. Louis, and in 1908, he entered railway service as an attorney for the St. Louis-San Francisco. The following year he was advanced to general attorney, and in 1925, he was appointed general solicitor. In 1927, Mr. Miller was elected vice-president and general solicitor and held that position until 1932. From that time until his resignation in 1934, he was general counsel first for the receivers and later for the trustees of the Frisco. He resigned in 1934 to resume general law practice in St. Louis.

Paul M. Benedict, who until July, 1918, was assistant to the president, assistant secretary, and assistant treasurer of the Chicago, Burlington & Quincy, and also assistant secretary of the Davenport, Rock Island & North Western and assistant secretary of the Paducah & Illinois, died at his home at Vineyard Haven, Vt., August 17. Mr. Benedict took a leave of absence from the Burlington in July, 1918, to serve the government in the chief district administration Department Aircraft Production of the War Department, and in 1920, after the war, became vice-president of the Tooele Valley Railroad. He was also, from 1920 to 1923, inclusive, assistant to vice-president of the Butte, Anaconda & Pacific. Both of the latter lines are owned by the Anaconda Copper Company.

David F. Peters, superintendent of the Scioto division of the Norfolk & Western, with headquarters at Portsmouth, Ohio, died after an extended illness, in the Portsmouth hospital on July 14. Mr. Peters was born at Pearisburg, Va., on December 19, 1874, and entered railway service in 1888, as a caller on the Norfolk & Western at Radford, Va. The following year he became a switchtender, but he resigned in 1891. He returned to the Norfolk & Western on April 9, 1894, as a brakeman on the Scioto division, and served on that division subsequently as a freight conductor, passenger conductor and assistant trainmaster. On January 8, 1910, he was transferred to the Pocahontas division and three years later he was promoted to trainmaster on the Scioto division. On January 1, 1916, he was transferred to the Norfolk division, and on September 1, 1918, he was promoted to superintendent of that division. On February 16, 1923, Mr. Peters was transferred to the Scioto division, with headquarters at Portsmouth, Ohio, where he served until his death.

Frank W. Conner, assistant passenger traffic manager of the Pennsylvania, with headquarters at Philadelphia, Pa., and vice-president of the American Association of Passenger Traffic Officers, died at Allegheny General Hospital in Pittsburgh, Pa., on August 22. Mr. Conner was born at Pittsburgh, Pa., on December 24, 1877, and entered railway service on the Pennsylvania. After serving in several minor positions, he was appointed secretary to the general passenger agent at Pittsburgh, Pa., on June 1, 1897. He subsequently served as chief clerk in the passenger department, district passenger agent and assistant general passenger agent at Pittsburgh, assistant general passenger agent at Chicago, general passenger agent for the Central Region, with headquarters at Pittsburgh, and passenger traffic manager for the Central Region, with the same headquarters. In July, 1929, he was transferred to Philadelphia and on June 1, 1932, he was appointed assistant passenger traffic manager at that point, the position he held until his death.